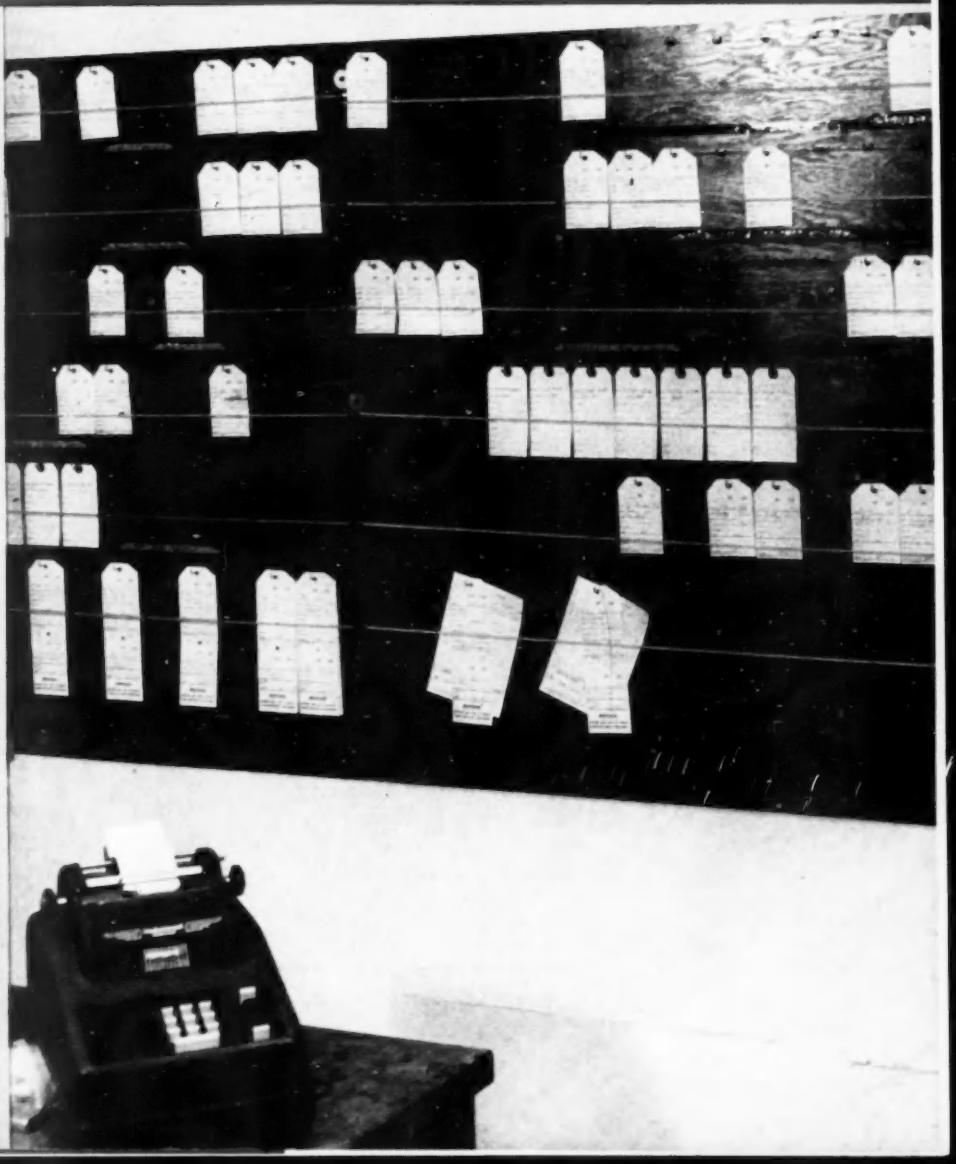
AMERICAN ARTISAN

OCTOBER 1953

Warm Air Heating
Residential Air Conditioning
Sheet Metal Contracting

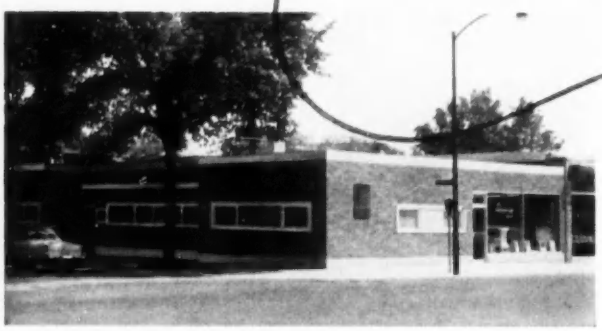
Features This Month



IN DIFFERENT STATES...

BUILT TO SERVE

DIFFERENT PURPOSES...



YET WITH ONE THING

IN COMMON...

they are all heated with dependable
JACKSON & CHURCH warm air heating systems

An apartment building in Michigan, a school athletic building in Iowa, a medical clinic in Illinois . . . the one thing they all need is dependable, clean heat. That's why J-C PoweRated furnaces from the large and complete J-C line were chosen. J-C warm air furnaces are economical on initial, operating and maintenance costs . . . they're efficient . . . they're dependable!

There's a J-C furnace to fill every heating need for residential, commercial or industrial installations. Get in touch with your J-C representative or write Dept. AA.

. . . America's Largest and Most Complete Warm Air Heating Line . . .

J-C

JACKSON & CHURCH CO. SAGINAW, MICHIGAN

Work well done since eighty-one

90 Lo-Boy for oil and gas firing — in other sizes too. Vestibule models also available.

● From most any angle — **beauty, construction, price, operation** — KO-Z-AIRE's got everything else beat by a country mile. All of which are mighty important things to have in your favor when selling heating.

But one big thing you're also concerned with is **installation.** And that's the angle we're stressing here.

What you see above is the bottom view of a KO-Z-AIRE Winter Air Conditioner. What you should know about it is that (like this one) most KO-Z-AIRE units have integrally-designed, one-piece, welded steel bases with cross-braced channels — features which cut installation time way down and boost profits way up — since there's no need for special grouting or cementing. In addition, most KO-Z-AIRE units are assembled and wired at the factory.

Another important angle this day and age is convertibility. And that again is a big advantage KO-Z-AIRE dealers enjoy — as several models are designed for ready conversion from gas to oil, or vice versa.

Pictured here are but a few of the over 30 gas and oil-fired models in the KO-Z-AIRE line. It includes furnaces ranging in capacities from 70,000 to 420,000 BTU input — a size for nearly every home, small church, school or commercial building.

But why not get all the facts and figures for your own inspection? Start now by mailing the coupon below.

COUNTERFLOWS and HI-BOYS

CONVERSION OIL BURNER

LO-BOY MODELS

Counterflow and Hi-Boy Models — Oil
79,700 — 105,000 BTU Output

Counterflow and Hi-Boy Models — Gas
70,000 — 125,000 BTU Input

Gas Conversion Burner
70,000 — 300,000 BTU Input

Lo-Boy Models — Gas
90,000 — 140,000 BTU Input

Lo-Boy Models — Oil
85,400 — 123,000 BTU Output

Larger models to 420,000 BTU

Oil Conversion Burner
0.75 — 12 gallons per hour

KO-Z-AIRE PRODUCTS, INC.

RED OAK, IOWA

Representatives in Principal Cities

mail coupon today!

KO-Z-AIRE PRODUCTS, INC. RED OAK, IOWA Dept. AA-10

Please send us details on KO-Z-AIRE Lo-Boy Winter Air Conditioners — plus information on the entire KO-Z-AIRE line.

NAME _____ TITLE _____

FIRM _____

CITY _____ STATE _____

KP-52-4

AMERICAN ARTISAN

OCTOBER 1953

FEATURES

DEPARTMENTS

Founded 1864

Volume 90 No. 10

RESIDENTIAL AIR CONDITIONING

WARM AIR HEATING

SHEET METAL CONTRACTING

Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"

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Syncromatic

OIL or GAS "500" SERIES
Fills Your Heating Needs

Easily convertible-
Complete conversion kits
for all models

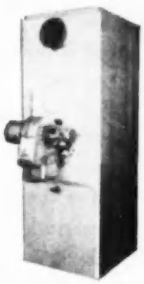
Patented counterflow heat
exchanger of superior
weight and construction

High efficiencies with
GAS or OIL

A G A approved for all
GASES

For complete information
write or call

SYNCROMATIC CORPORATION
Watertown, Wisconsin

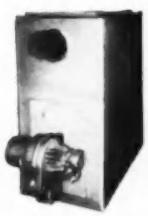


OIL HI-BOY
OU-510
85,000 B.T.U. Output

GAS HI-BOY
GU-508-509
80-100,000 Input

DELUXE LO-BOY
O-510-G-509

100,000 B.T.U. GAS Input
85,000 B.T.U. OIL Output



STANDARD LO-BOY
O-510-G-509

GAS COUNTERFLOW
GC-508-509
80-100,000B.T.U. Input

OIL COUNTERFLOW
OC-510
85,000 B.T.U. Output

the editor's notebook

Readers Like Customer Relations Article

Oklahoma City, Okla.

IN REGARD to the article entitled *Ten Steps to Better Customer Relations* which appeared in the September Artisan, I would like to state that these 10 rules are good ones for any business to comply with. I believe that one more rule might have been included. That is, *Always perform on your contract with a customer in accordance with the terms of your contract — never misrepresent a job.*

I think this is a fine article, very well written.

CHAS. H. DE LAUGHTER
C. C. COOKE CO.
Heating and Sheet Metal Contractors

Peoria, Ill.

WE HAVE read the article *Ten Steps to Better Customer Relations* in the September American Artisan. We are pleased to learn that editorial writers are recognizing the necessity for operating a heating and sheet metal shop like any other enterprising service business. We practice these rules around our place and have been doing it for quite a number of years. To us it is a wholesome thought that the American Artisan, as one of the older trade papers, sees fit to publicize customer relations in our industry. This has definite educational value for those who gain their living in the heating, sheet metal and air conditioning business.

LEE WAGENER SUPPLY CO.
Heating and Sheet Metal Contractors

How You Benefit From Our ABC Membership

PERHAPS you have noticed the ABC symbol displayed each month on our contents page and have wondered what this means to you as a reader of American Artisan. This symbol denotes membership in the Audit Bureau of Circulations, whose function it is to audit the circulation of newspapers, general magazines and business papers.

The ABC audit shows us you pay to read what we have to say. (In fact, American Artisan is the only 100 per cent paid publication in its field.) It also would show if we ceased to serve you well. This constant check of your interest keeps us on our editorial toes. In short, we have a contract with you to deliver a *specific* number of issues of a *specific* editorial character for a *specific* length of time at a *specific* price.

the editor's notebook

(continued)

GAMA Board to Meet In St. Louis

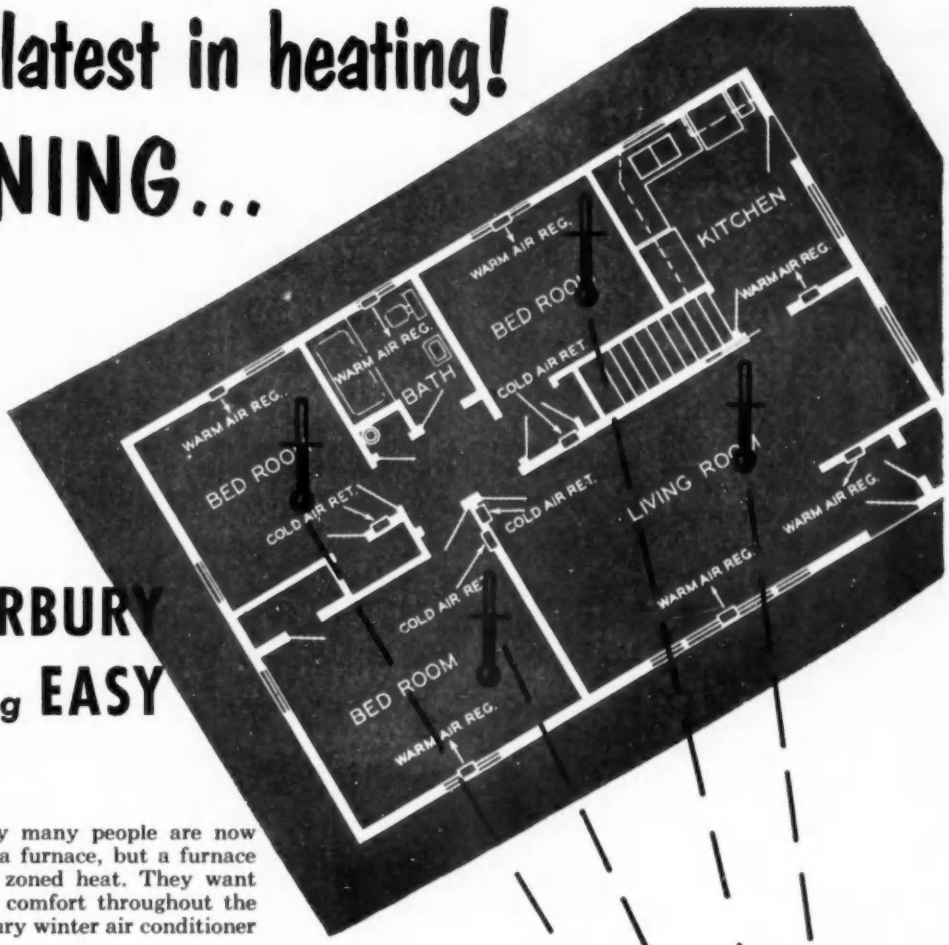
NEW and retiring officers of the Gas Appliance Manufacturers Association will hold a board of directors meeting in St. Louis on October 25, in conjunction with the annual convention of the American Gas Association. New officers will assume their duties at the conclusion of the convention. They are: Sheldon Coleman, president; T. T. Arden, first vice president; W. F. Rockwell, Jr., second vice president; and Lyle C. Harvey, treasurer. New division chairmen, who will also become members of the board, are: Harold C. Day, gas house heating and air conditioning equipment; Robert D. Smith, gas incinerator; Frank H. Post, automatic controls; and Thomas D. Bromley, direct heating equipment.

Employer Pension Plans Up 55 Per Cent

WITH 20,675 Treasury approved employer pension plans in effect on June 30,

It's the latest in heating!

ZONING...



and WATERBURY *makes zoning* EASY

All over the country many people are now demanding not just a furnace, but a furnace that will give them zoned heat. They want the type of uniform comfort throughout the home that a Waterbury winter air conditioner will give them.

Zoned heating makes it possible to have the same temperature all over the house, or different temperatures in different parts of the home. The Waterbury line of furnaces and winter air conditioners is ideal for this purpose, as many Waterbury units are built to provide zoned heating without change, and all can be adapted to it.

Waterbury *furnaces*

AND WINTER AIR CONDITIONERS

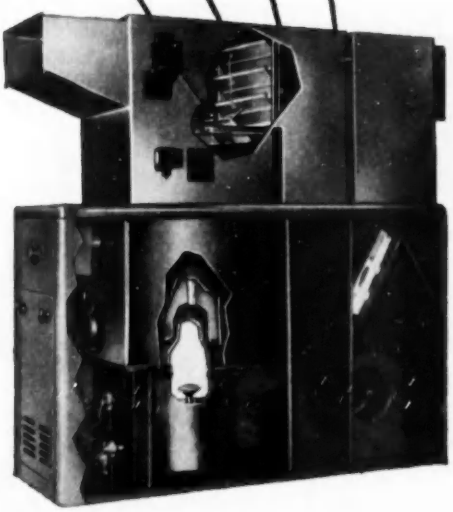
The Waterman-Waterbury Company has specialized in warm air heating for almost half a century. It manufactures a complete line of furnaces, and winter and summer air conditioners. The Waterbury line is nationally known as a quality product.

Write today for information on the comprehensive Waterbury dealer-distributor-factory policy.

The Waterman-Waterbury Co.

OVER 46 YEARS OF WARM AIR HEATING

1122 Jackson St. N. E. • Minneapolis 13, Minnesota



Comfortrol By-Pass systems can be installed in various combinations. Shown here is a typical installation.

the editor's notebook

(continued)

1953, a new all time record was established for the year, with a net gain of 3657 in the number of employer plans. This is 55 per cent more than the 2347 gain in such plans established in the year ending June 30, 1952, and 46 per cent more than the World War II previous all time average of 2507 plans a year. These facts are reported by the Employee Benefit Plan Review Research Reports, Chicago, and are based on an analysis of Internal Revenue Service (new name of Bureau of Internal Revenue) records.

On January 1, 1930, there were only 110 approved pension and profit sharing retirement plans in effect. Only 549 more plans were approved during the 1930's, a total of 659 plans being in effect on January 1, 1940. This means that 96.8 per cent of all employer pension or profit sharing retirement plans now in effect were established during the last 13 years.

To gain the full tax advantage for the pension or profit sharing retirement fund and to qualify the employer contributions to such plans as a deductible business expense for income tax purposes, it is necessary to meet certain requirements prescribed by the law and Internal Revenue Service regulations. Since substantial sums of money are involved, practically all employers seek approval of the plans in advance of their establishment.

Can "Anyone" Install Cooling System?

IN A RECENT issue of a popular "handyman's" magazine, an illustrated article of several thousand words explained how the layman could install cooling in his home. It told him how to modify the existing warm air heating system to adapt the cooling equipment. The article is filled with advice for the handyman; it recommends that all supply registers be replaced, tells how to install a slide damper in the plenum chamber, and suggests that an "opening be cut in the side of the furnace" (!) so that a connecting duct can be run to the cooling package.

The instructions include recommendations that the home owner call on the local sheet metal contractor who will help him select the correct size equipment, make the sheet metal fittings, and provide advice on how actually to install the equipment.

An incomplete electrical wiring diagram is also shown, and it is suggested that the layman get "a friend who is an electrician" to make the wiring circuit hook-up.

In response to this article, several readers wrote the magazine for additional information. The magazine gave them American Artisan as a source of this information.

We advised them that they would not only find it cheaper to have a warm air heating dealer make the complete installation, but that they would have a better installation because the skill, training and experience required to select, fabricate and install cooling equipment cannot be acquired easily by the average home owner. This background can only be supplied by the sheet metal and warm air heating dealer.

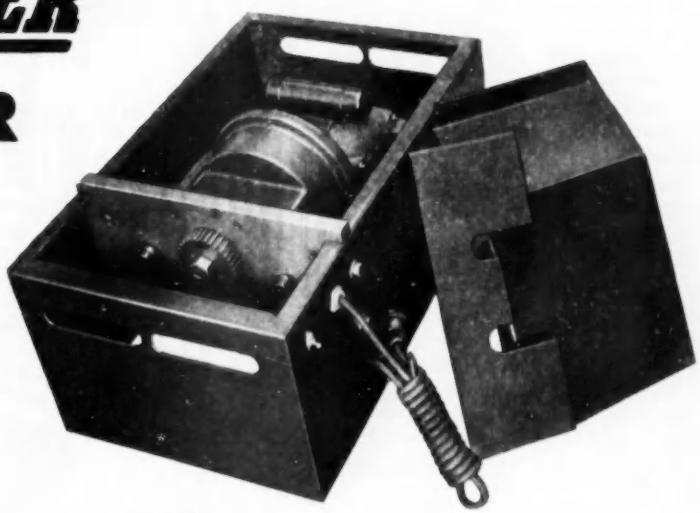
Record Steel Tonnage Shipped in First Half

SHIPMENTS of steel products made a six months record in the first half of this year, with 42,356,861 net tons,

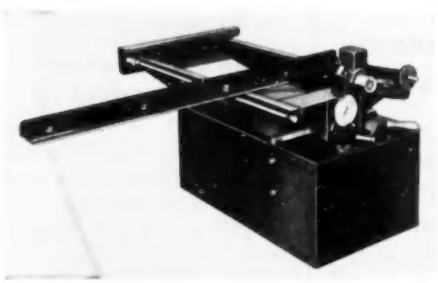
Now it's here...*the* New...

LOCKFORMER

POWER UNIT *for* Slitting Attachments



- ✔ it drives all models of Lockformer Slitting Attachments
- ✔ it's portable . . . gives you power slitting right on-the-job
- ✔ it eliminates mounting and dismounting of slitting attachment (If you are interchanging Slitting Attachment with Flanging Attachment)
- ✔ it's low-cost . . . although price is subject to change, it's now pegged at less than $100.00



Designed and built for dependable, rugged performance, the Power Unit features a ¼ h.p., ball bearing capacitor type motor with bronze worm gear reduction. Steel gears are heat-treated and quiet running. Gear drive operates in sealed oil bath with easily accessible filler plug. Complete with cord and on/off switch.

Unit may be purchased separately to drive your present Lockformer Slitting Attachment or may be purchased in conjunction with the Slitting Attachment to give you a complete self powered slitter.

For Complete Information Write....

THE LOCKFORMER CO.

4615 WEST ROOSEVELT ROAD • CHICAGO 50, ILLINOIS

the editor's notebook

(continued)

according to American Iron and Steel Institute. A record also was made in shipments for the month of June, with a total of 6,950,059 tons. Nearly all industries received larger tonnages of steel in the first half of this year than in the similar 1952 period.

The half-year total was nearly 10 million tons higher than the 32,968,625 tons shipped in the first half of last year, and was about 2.3 million tons above the total for the best previous first half, in 1951. Last year, shipments were held down by the strike of steelworkers. In June 1952, the monthly shipment figure was 1,250,243 tons.

Record high shipments of cold rolled sheets, hot rolled bars, and electrolytic tin plate were made in the first half of this year. Other products for which shipments were substantially higher than in other recent half-year periods included semi-finished forms, rails, plates, bars, line pipe and oil field equipment.

NWAHACA Cites Research Benefits

THE NATIONAL Warm Air Heating and Air Conditioning Association is sending periodical releases to local newspapers to bring to the public's attention the benefits of forced warm air heating. The association's latest release deals with the research that lies behind many of the new developments featured in present day heating and air conditioning systems. NWAHACA points out that it has carried on a continuous research program in cooperation with the mechanical engineering experiment station of the University of Illinois since 1918. Consumer benefits cited as results of such

the editor's notebook

(continued)

research programs, in addition to mechanical improvements in heating and air conditioning systems, include the establishment of a standard rating formula applicable to all warm air furnaces and the setting up of similar standards for the correct size, design and installation of all types of warm air distributing systems. These standards have benefited the home owner because they have simplified the selection of heating and distributing equipment and corresponding economies in installation costs have been made possible.

NWAHACA states that its primary objective is to "constantly improve the design, engineering, installation, and operation of warm air heating and air conditioning systems in order to increase owner and user satisfaction."

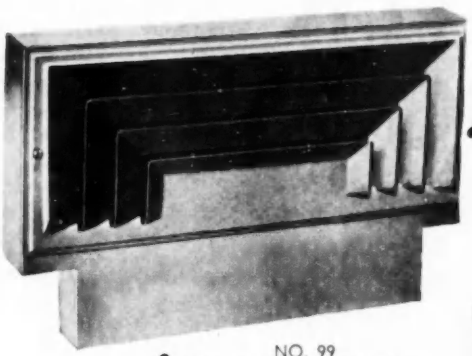
Expansion Program for Oil Industry

THE OIL HEAT Institute reports that the petroleum industry has spent $19.3 billion in expanding and improving its facilities since World War II. Plans call for spending $4 billion more in 1953.

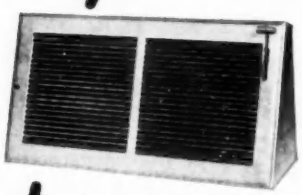
Good Designing Can Cut Cooling Costs

ACCORDING to *House & Home* magazine, cooling costs in an air conditioned house can be cut from 25 to 50 per cent if the design is right. In a recent issue, Charles S. Leopold, consulting engineer, and past president of the American Society of Refrigerating Engineers, explained the proper construction and accessories for a house design for air conditioning, summarizing facts stemming from research conducted by the University of Illinois, the National Warm Air Heating and Air Conditioning Association, and by

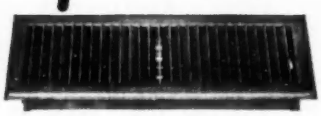
OUTSTANDING



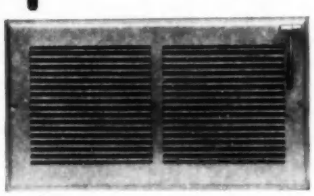
NO. 99
OUT OF WALL PERIMETER
REGISTER



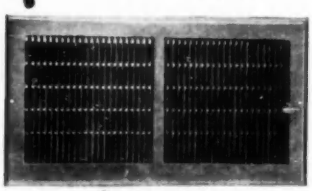
NO. 243 BASEBOARD PROJECTION
REGISTER



NO. 512 PERIMETER FLOOR
REGISTER

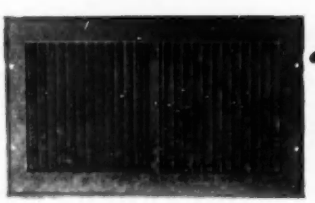


NO. 20 HORIZONTAL FIN SIDEWALL
REGISTER



NO. 30
VERTICAL FIN
SIDEWALL REGISTER

GET IT FROM YOUR JOBBER



NO. 305
VERTICAL FIN SIDEWALL
MULTIPLE LOUVER REGISTER

MIDCO REGISTERS

Yes, sir, Midco Registers are not just another line, they have unique features that make them tops in the field. Correct in design, simple and efficient in operation, beautiful in appearance—dealers and jobbers all over the country say "OUTSTANDING!"

And for you, *Mr. Installer,* Midco Registers, grilles and floor faces are quality products supplied in a wide variety of styles and sizes. For instance, Nos. 30 and 34 multiple louver registers come in forty-four sizes, from 6 x 4″ to 30 x 10″.

Competitively priced, Midco's popularity grows daily throughout the nation. Installers will be interested in Midco's complete story. Ask your jobber or write to factory today.

profit makers for jobbers

Jobber outlets still available in some areas. Write for catalog and price lists.

MIDCO

REGISTER CORPORATION

1059 GRAND AVENUE • ST. PAUL 5, MINNESOTA

the editor's notebook

(continued)

leading manufacturers.

Almost every design change will have some effect on how much heat the cooler must pump out of the house.

In addition to specifying the number of Btu produced by sun heat on a given surface, the article offers such common sense information as the fact that white paint is one of the cheapest ways to cut cooling costs and that old fashioned shutters are very useful for shielding east or west windows.

U.S. Becoming Prosperous "One-Class" Market

THE UNITED STATES is fast becoming a one-class market of prosperous middle income people, according to the U. S. Chamber of Commerce. In 1929, the publication points out, the richest 5 per cent of the people had about 34 per cent of total take home pay. Today the figure is about 15 per cent, due largely to the leveling effect of the progressive income tax. Lower income groups, on the other hand, have been receiving a larger share due to the decline in unemployment since the depression of the 1930's.

Gas Sales Show Gain Over Previous Year

THE AMERICAN Gas Association states that natural gas sales by utilities during the 1952-1953 heating season increased 9.6 per cent in volume, 17.1 per cent in revenues, and 13.3 per cent in number of customers over the preceding year.

U. S. Finds More Oil

OIL seepages have recently been discovered by geological survey experts in the uninhabited Malaspina Glacier area of southern Alaska, according to a report by

the editor's notebook

(continued)

Douglas McKay, Secretary of the Interior. The seepages were found in the course of reconnaissance geologic mapping undertaken as part of the U.S. Geological Survey's program to investigate the petroleum possibilities of the Gulf of Alaska Tertiary Age sedimentary rocks.

Salesmen Just Want the Facts

TODAY'S salesman, according to a survey conducted by *Electrical Wholesaling*, wants to hear facts at a sales meeting. He wants a complete description of products and their uses; tips on how to sell a product; charts, models and films to bring out sales points; comparison of products with competitors' lines; suggestions on how to meet sales arguments of competitive products; prices compared with those of competitors; demonstration gimmicks and samples to help sell the product; data on size of market and how much it is worth; a question and answer period to help clear up problems; and an outline of national consumer product advertising.

Most salesmen indicated they feel sales meetings generally are too long drawn out. Other practices listed as objectionable by salesmen included falsely enthusiastic pep talks by executives, attempts to gloss over a product's weak points, longwinded presentations, canned talks, false claims and half truths.

U. S. Doubles Oil and Gas Consumption

THE UNITED STATES has increased its oil and natural gas consumption at the rate of 10 per cent a year since World War II, according to the Oil Heat Institute. It now consumes twice as much as it did in 1940.

Mueller Climatrol

TYPES 116-216 Winter Air Conditioners

90,000 — 116,000 — 130,000 and 150,000 Btu input

New! Beautiful!

Pre-Wired
Pre-Assembled
Gas or Oil Convertible
Low-Cost Installation

This attractive Mueller Climatrol Type 116-216 is designed not only to please your customers, but to help ease your installation job. It's pre-wired and pre-assembled, cuts your labor time, increases your profits. Because it's shipped in two sections, it goes down narrow, winding basement stairways without trouble.

The Type 116-216 is compact (only 45" high, 24½" wide, 61½" long on smaller sizes); is available in four sizes — 90,000, 110,000, 130,000 and 150,000 Btu input.

Another thing! The Type 116-216 has famous Mueller Climatrol Designed Convertibility. Say your customer doesn't have gas heat, yet. But he wants the convenience and comfort of automatic heating. So he buys the unit with the oil burner installed now — converts to gas later. The conversion cost is small because Mueller planned it that way — with *Designed Convertibility.*

Go over this top-notch heating plant with your customer. Show him all the things that will please him. Corrugated-asbestos insulation, with aluminum foil backing. Heavy-gauge, welded-steel heat exchanger. Free-floating radiator, connected to drum at back only, for quiet operation. It's easy to sell because it's the best home-heating plant manufactured today!

Write for descriptive literature to the L. J. Mueller Furnace Co., 2030Q W. Oklahoma Ave., Milwaukee 15, Wisconsin.

96th Anniversary **Mueller Climatrol**

NEWS FROM

Announcing revolutionary new design in Air-Oil Fuel Units

ANSWER NEED ON LOW CAPACITY HEATING PROBLEMS

Renewed interest in low-pressure, air-oil heating systems for compact, modern housing has led to the unveiling of a revolutionary new Sundstrand fuel unit for firing rates from .4 to 1.5 gallons per hour. This new development will supplement the present lines of Sundstrand high-pressure fuel units for manufacturers interested in air-oil systems.

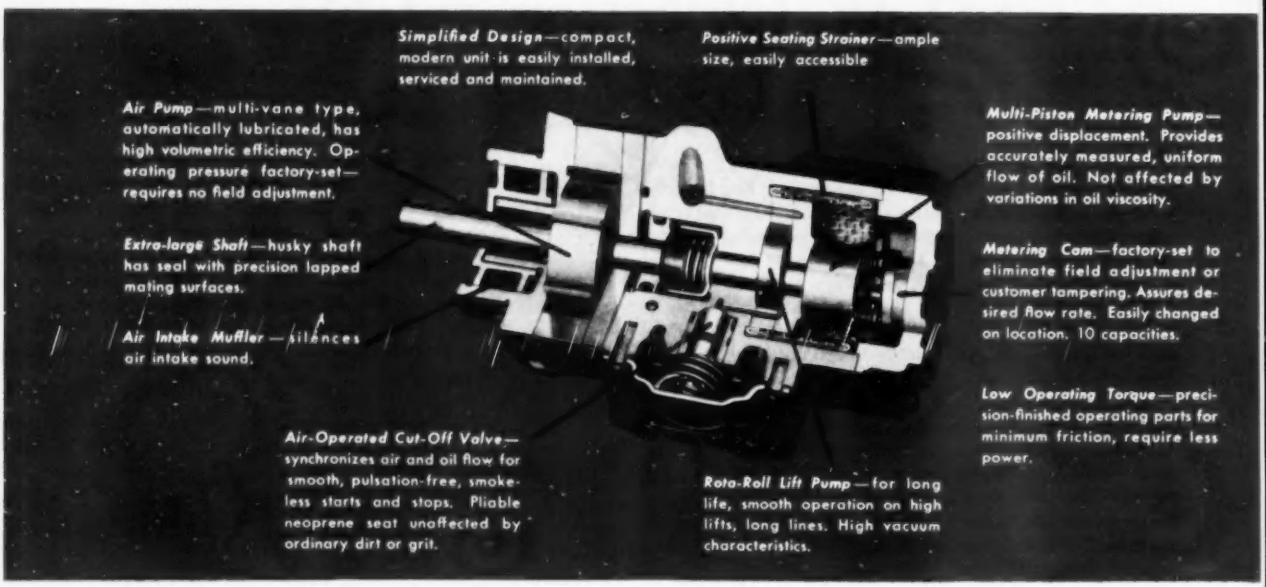
HAS ALL "WANTED" FEATURES IN A SMALL, COMPACT UNIT

During several years of research and development, Sundstrand determined what users, servicemen and manufacturers needed in an air-oil unit. All of these "wanted" features have been designed into this new model. The result is a small, compact, efficient, economical fuel unit which is now available to manufacturers in the right size at remarkably reasonable prices.

EXTENSIVE TESTS ARE "EYE-OPENERS"!

Testing over a period of years indicates performance far beyond expectations. There is no question now that in this handful of modern hydraulic design (unit measures less than 7" in length, 3" in diameter, weighs only seven pounds) lies the key to untold new advances in low-pressure heating. Within a matter of months, results will be seen on the sales floors and in the homes of Americans everywhere. The new fuel unit represents another pioneering contribution from Sundstrand.

NOTE: *Burners must be designed specifically to use this new fuel unit. Except on manufacturers' recommendations, the unit should not be installed in the field for conversion of high-pressure to low-pressure type systems.*



SUNDSTRAND!...

Precise, positive synchronization of air and oil flow!

With this sensational new fuel unit, accurately measured quantities of air and atomized oil meet at the nozzle for smooth, efficient combustion all through the heating cycle. Only with air and oil supply systems created by designers with a wealth of hydraulic "know-how" is such precise synchronization possible. Look at the results—one nozzle handles the entire .4 to 1.5 gallons per hour firing range—no small orifices are needed! No smoking at starts or stops . . . no carbon formation . . . no pulsation . . . just remarkably efficient operation over years of satisfying heating service.

Sundstrand is mighty proud of this new fuel unit. You will be, too, when you realize all the benefits which will accrue to you. Simple to install, with all connections readily accessible. Simple to service—strainer is quickly available for cleaning—metering cam is quick to change if necessary. Trouble-free for years and years, due to proved principles of Sundstrand design and Sundstrand's precision production. Of course, each unit is individually tested and certified. You can't afford not to be "in the know" about this sensational development—get complete data in bulletin 1107.

SUNDSTRAND

SUNDSTRAND FUEL UNITS

SUNDSTRAND MACHINE TOOL CO.

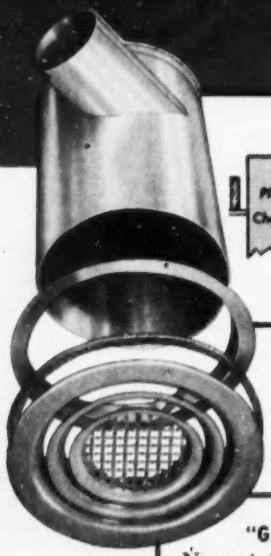
HYDRAULIC DIVISION, ROCKFORD, ILL.

The Right Register—

FOR EACH OF YOUR SMALL PIPE INSTALLATIONS

BY

Char-Gale



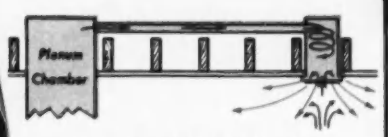
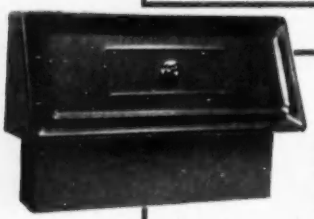


Diagram of typical Char-Gale "Gale-Aire" Ceiling Diffuser Installation.

A circular outward thrust imparted to the air entering the register box, produces a partial vacuum in the center of the cylinder. Room air is drawn up into the box and blended with the heated air to provide a gentle, effective warming action.

"GALE-AIRE" CEILING DIFFUSER

Newest Char-Gale register, the "Gale-Aire" Ceiling Diffuser is designed to provide effective air tempering and distribution. The unit includes a cylindrical box, fitting ring, foam rubber gasket, and register.



"GALE-AIRE" BASEBOARD REGISTER

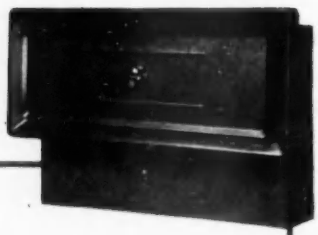
Including all the features of the Sidewall Register, the "Gale-Aire" Angle Baseboard Register is designed especially for older homes. It is installed through a floor opening, with no wall cuts needed.

MEMBER INDOOR COMFORT

Remember:

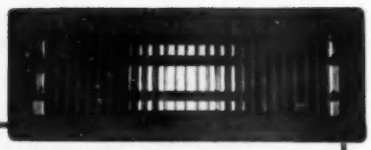
Char-Gale provides everything from plenum to register in the "Gale-Aire" System. Also a complete line of fittings for both your small pipe and conventional installations.

Proper registers are essential to the proper operation of small pipe systems. Char-Gale's complete selection makes it easy for you to choose exactly the right register for every situation.



"GALE-AIRE" SIDEWALL REGISTER

The "Gale-Aire" Sidewall Register distributes air evenly in all directions along the wall. Adjustable, it permits complete balancing at the registers. Complete with register, box and a foam rubber gasket.



"GALE-AIRE" FLOOR DIFFUSER

Answers the need for an inexpensive method of distributing air along outside walls. Vanes set at proper angles to achieve a fan-shaped diffusion pattern.

Contact your jobber or write us direct

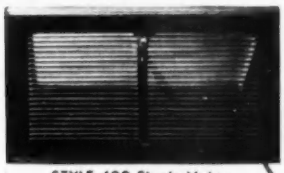
CHAR-GALE MANUFACTURING COMPANY

MINNEAPOLIS-MINNESOTA

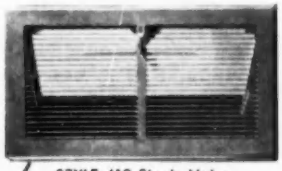
The Right Register FOR YOUR CONVENTIONAL INSTALLATIONS

Your best source of conventional registers is still Char-Gale, whether you are installing forced air systems, gravity systems, or both. While introducing many improvements in the small pipe system, we at Char-Gale want to remind you that we are continuing our production of conventional registers. They're still coming off our production lines to give you proper air distribution and customer satisfaction. For more information, contact your jobber.

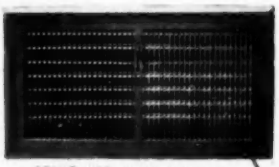
for FORCED AIR SYSTEMS



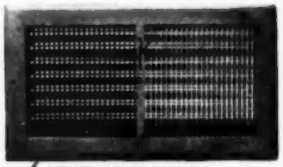
STYLE 400 Single Valve Baseboard Register



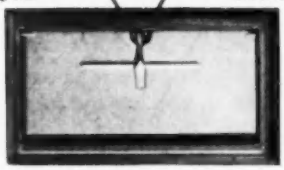
STYLE 410 Single Valve Sidewall Register



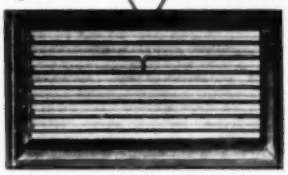
STYLE 402 Multiple Vane Baseboard Register



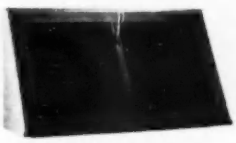
STYLE 412 Multiple Vane Sidewall Register



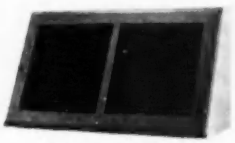
Rear View STYLES 400 and 410



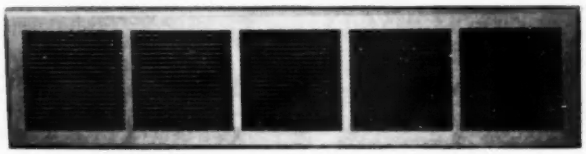
Rear View STYLES 402 and 412



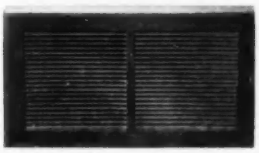
STYLE 403 Single Valve Out-of-Wall Register



STYLE 418 Return Air Out-of-Wall Register



STYLE 415 Return Air Baseboard Vent (Long)
STYLE 420 Return Air Sidewall Vent (Long)



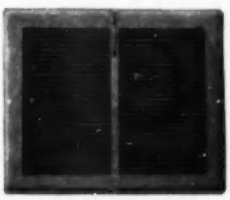
STYLE 415 Return Air Baseboard Vent
STYLE 420 Return Air Sidewall Vent

Also

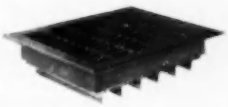
SPACE-SAVING
TIME-SAVING
LABOR-SAVING
CHAR-GALE
PACKAGED
FITTINGS

for GRAVITY SYSTEMS

STYLE 810, 812, 912, 1113 Baseboard Register



STYLE 807 and 808 "Wafer" Sidewall Register



Floor Register

Steel Face Return Air Floor Register

CONTACT YOUR JOBBER OR WRITE US DIRECT

Your customers will marvel . . . and you'll profit when you install an

ELECTRONIC OUTDOOR THERMOSTAT THAT CONTROLS INDOOR "CLIMATE"

In chilly weather . . . or on mild days . . . your customers are assured comfort they've never known before when you install Honeywell Electronic Moduflow.

Moduflow provides constant comfort. It's the first control system to *vary* indoor temperatures . . . tests show that for more comfort, indoor temperatures should go up as the mercury drops outside. That's why you have *two* thermostats with Electronic Moduflow—one located outside and one inside the house.

Moduflow is easy to sell. As soon as prospects see how Electronic Moduflow uses an outdoor control to vary indoor temperatures according to weather changes, they're easy to sell. Electronic Moduflow is packed with many unusual features that can't be found on ordinary systems.

Moduflow is easy to install. The new, simplified Electronic Moduflow system is easy to wire and calibrate.

Moduflow is easy to service. Because it's *electronic*, and has no moving parts, Moduflow is simple to service.

Moduflow is ideal for any home. Everyone is a prospect for Electronic Moduflow, provided he has an adequate heating plant. Thus there's no limit to prospects—and one Moduflow customer always leads you to another.

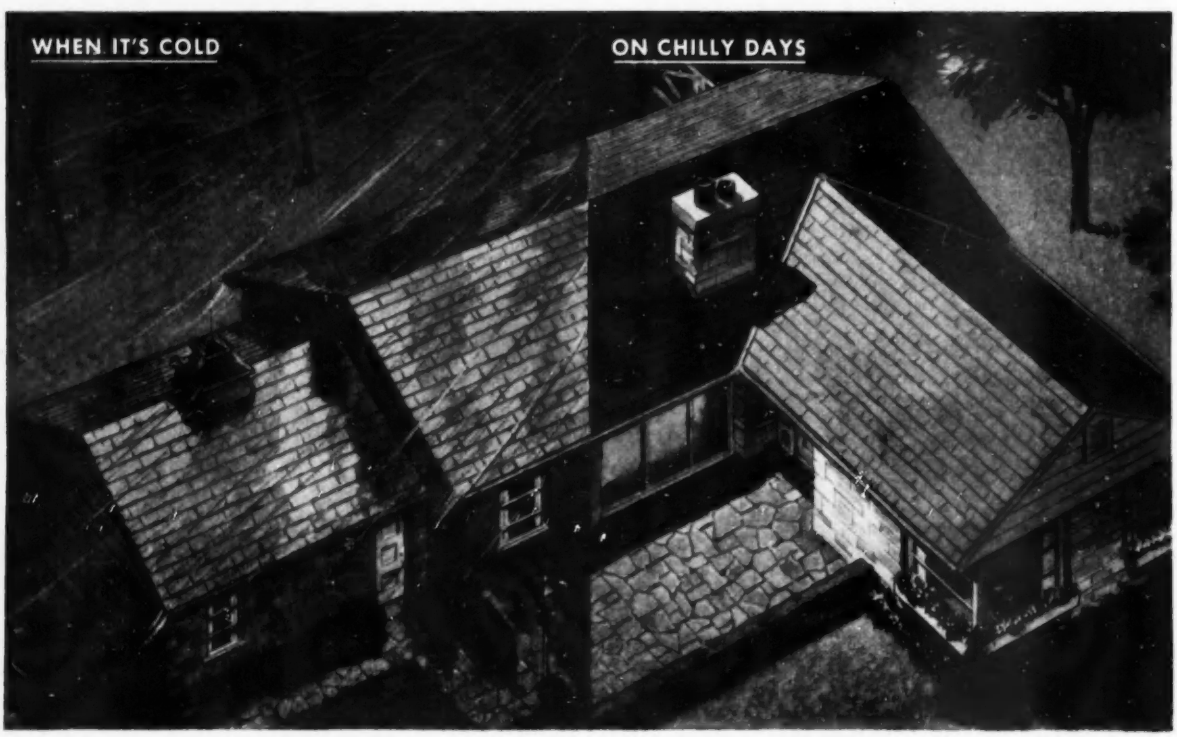
Get started now on Electronic Moduflow. Find out how easy it is to sell—and you'll see why it's one of the most outstanding profit opportunities for heating dealers in years!

These leading dealers are sold on Electronic Moduflow . . .

←
Ralph Bashor, Loveland, Colorado: "Customers can't help but appreciate the vastly superior comfort."

→
John Mauldin, Atlanta, Georgia: "Moduflow makes it easier for me to *satisfy and keep* customers."

A strong national advertising program helps pre-sell your prospects. Your prospects see interesting, hard-selling ads on Moduflow in national magazines, which make your selling job even easier. In addition, literature, displays and other material are available.



Here's how Electronic Moduflow works

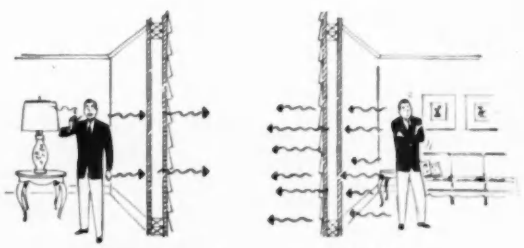
The sketch shows how Moduflow's three main electronic units work together to *vary* indoor temperatures automatically according to outdoor temperature changes.

1. Electronic Weathercaster, outside, automatically raises or lowers control point of indoor thermostat, when outdoor temperature changes.

2. Electronic Clock Thermostat, inside, measures indoor needs and sets percentage of burner "on" time needed to hold control point.

3. Electronic Relay Amplifier receives these signals and then cycles the burner according to the percentage rate set by the indoor thermostat.

Moduflow provides more comfort by varying indoor temperatures



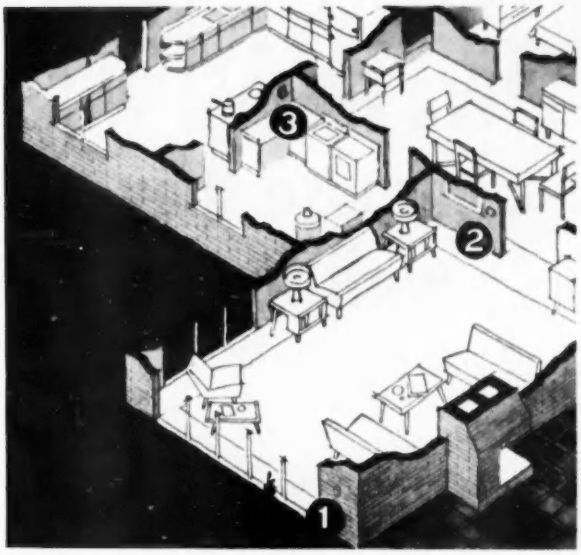
COMFORT DISCOMFORT

Why people need varying temperatures

Tests show if indoor temperature is merely held constant when outdoor temperature falls, a person inside *feels* uncomfortable. This happens because as walls become colder, they "draw" heat from the body.

MINNEAPOLIS **Honeywell**

Electronic Moduflow



"Cold Wall" problem solved by Moduflow

With chilly temperatures (top sketch), occupants feel comfortable when indoor temperature is 71°. But if the mercury drops (sketch above), heat losses increase, so *higher* indoor temperature is needed to compensate for colder walls. Honeywell Electronic Moduflow does this *automatically* by raising control point of indoor thermostat.

MINNEAPOLIS-HONEYWELL REGULATOR CO.
Dept. AA-10-211
Minneapolis 8, Minnesota

Gentlemen:

Please have your representative show me your "Dealer Profit" program for Electronic Moduflow.

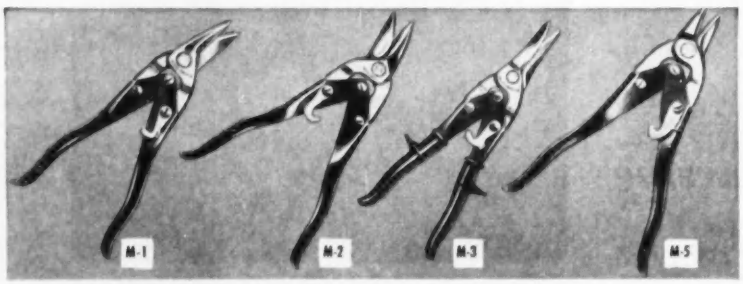
Name .....

Address .....

City ..... *Zone* ..... *State* .....

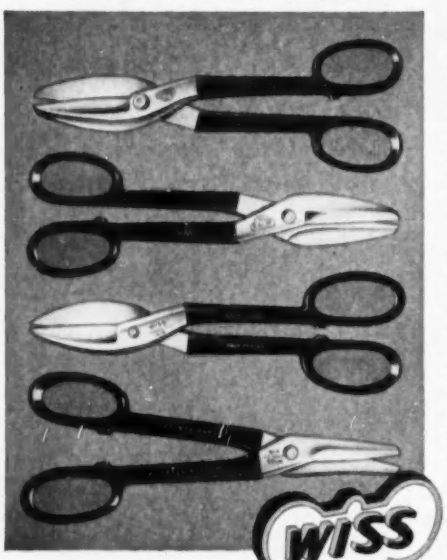
"We feature WISS SNIPS because they sell best with fewer returns"

W. P. Schnase, Buyer of W. D. Allen Mfg. Co., 566 West Lake St., Chicago, Illinois, agrees with other distributors of Wiss metal cutting snips. There are several reasons why they are the choice of professional workers everywhere—why they sell better, with fewer returns. Wiss snips are produced largely by the handwork of skilled workers. Each pair is rigidly tested and guaranteed perfect. Bolts are set precisely to reduce wear and to increase cutting power with least effort.



WISS METAL MASTER SNIPS: Compound action design delivers amazing cutting power. These 10" snips cut with about one-half the effort required for standard 12½" snips. One edge serrated to prevent slipping. M-1 (cuts left) and M-2 (cuts right) are designed to cut the most intricate scrolls and circles. M-3 is for shallow arcs and straight cutting. M-5 Bulldog Heavy Duty snips are tops for notching, nibbling and cutting shallow arcs in sheet metal as heavy as 16 gauge.

Wiss inlaid blades are made of high carbon crucible steel welded to a hot drop-forged frame to provide the extra service demanded by professional workers.



WISS INLAID SNIPS

High carbon crucible steel welded to a hot drop-forged frame provides that *extra* service demanded by professional users everywhere. Six Straight Cutting sizes from 11½" to 17", including Bulldog Snips for notching. Three Combination* Cutting sizes, 12½", 13½" and 14½".

WISS SOLID STEEL SNIPS

For those whose requirements are less specialized than the professional user. Hot drop-forged of fine carbon steel, they meet or exceed government specifications. Four straight cutting sizes, 8" to 12½". Three Combination* Cutting sizes, 7" and 13" including 16" Bulldog Snips for notching.

*Made with straight blades, but ground and shaped so they readily cut curves and irregular shapes as well as straight.

Wiss snips are hot drop-forged of the finest steels available.

Highly skilled craftsmen make final adjustments to assure that Wiss snips will cut perfectly for a long time.

J. WISS & SONS CO., NEWARK 7, NEW JERSEY

Manufacturers of Shears, Scissors, Pinking Shears, Metal Cutting Snips and Garden Shears

New **MOR-SUN** Heat Exchangers

GUARANTEED

—to make your selling easier!

1. Guaranteed Heat Exchanger Gives More Heat
2. Aluminum Foil-Fiber Glass Insulation
3. Burner Parts Easily Accessible
4. Improved Oil and Gas Burners Interchangeable
5. Long-Life Stainless Steel Combustion Chamber
6. Removable Vestibule Door
7. Single Exhaust Vent
8. No Noisy Metal-to-Metal Contact at Division Panel
9. Two Large Air Filters
10. Quiet, Powerful Blower
11. Solid Base with Leveling Screws
12. Radiator Side Pans Increase Heating Surface

Mor-Sun Warm Air Furnaces — Gas or Oil Fired — come in 10 models, conventional or reverse flow. Output range 52,000 to 152,000 BTU's.

for MORE PROFIT with MOR-SUN Mail this coupon

• Sell MOR-SUN Furnaces and you can sell with confidence. To make your sales job easier we offer MORE with MOR-SUN . . . a 10 Year written Guarantee on every MOR-SUN Heat Exchanger in addition to our standard one-year warranty on all complete units. Check these 12 points of superiority and you will see why we do not hesitate to guarantee any MOR-SUN Warm Air Furnace.

Don't pass up this opportunity to get *all* the details on how you can sell more heating systems . . . easier . . . at a greater profit! Fill in this coupon . . . prove to yourself that, to you as a heating equipment dealer . . . MOR-SUN offers MORE.

MORRISON STEEL PRODUCTS, INC.
609 Amherst Street, Buffalo 7, N. Y.

Gentlemen:

Please send me complete information on MOR-SUN'S Plan for Profits.

Firm Name .....

Address .....

City ..... Zone ..... State .....

(Please Check)

☐ Distributor ☐ Dealer ☐ Installer

MOR-SUN
PRESSED STEEL FURNACES
®

MOR-SUN FURNACE DIVISION

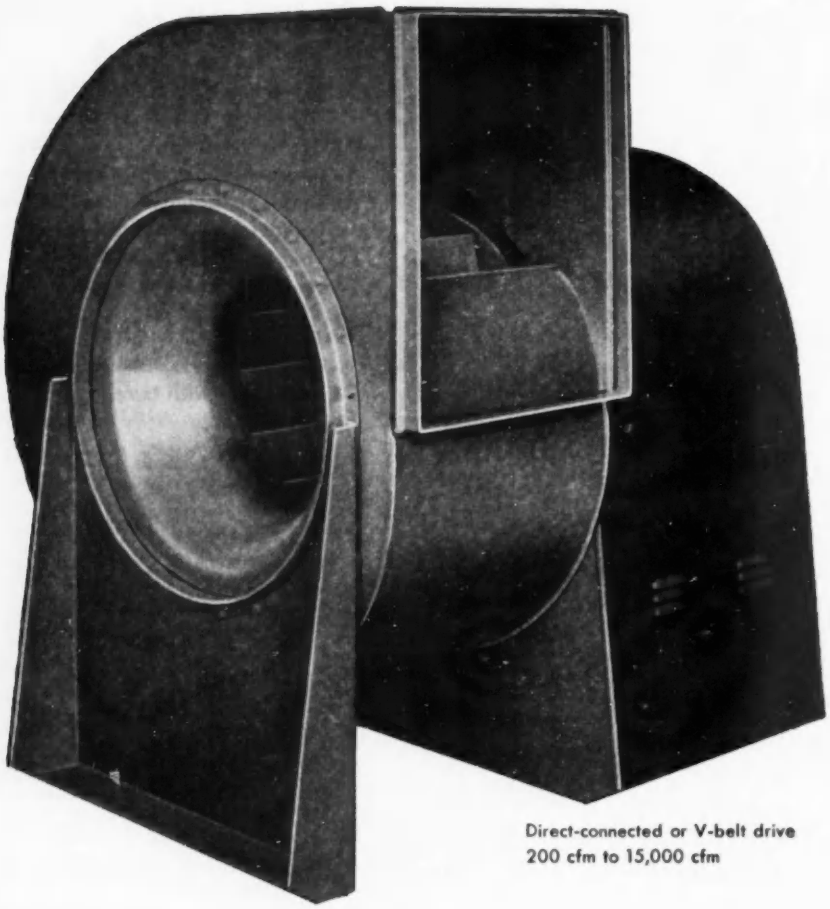
MORRISON STEEL PRODUCTS, INC.

609 AMHERST STREET • BUFFALO 7, N. Y.

ALSO MANUFACTURERS OF ROLY-DOOR STEEL SECTIONAL GARAGE DOORS AND CARRY-ALL TRUCK BODIES

NEW!

ALL-PURPOSE VENTILATING SETS YOU CAN PUT INTO SERVICE FAST!



Direct-connected or V-belt drive
200 cfm to 15,000 cfm

Here's a new line of Westinghouse motor-driven ventilating sets. They are ideal for general purpose ventilation, for exhaust, for processes, and for removal of heat, fumes and vapor.

Where changing plant or building conditions create an unexpected need for ventilation, these sets are a quick solution. Here's why:

COMPACT SIZES—down to 10" x 12" x 16"—take little space, are easy to install.

SINGLE UNIT—fan, motor and drive all made and assembled by Westinghouse.

DIRECTION OF DISCHARGE—can be changed on the job.

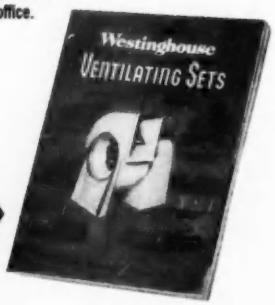
LOW MAINTENANCE permits use of out-of-the-way locations.

WEATHERPROOF COVERS permit outside installation.

SHORT DELIVERIES get your job started sooner.

These ventilating sets are low in first cost, low in operating cost. You get a single warranty because fan and motor are both built by Westinghouse.

For other exclusive features and full information, ask for Catalog 1160. Call your local Westinghouse-Sturtevant office. Or, write Westinghouse Electric Corporation, Sturtevant Division, Hyde Park 36, Massachusetts.

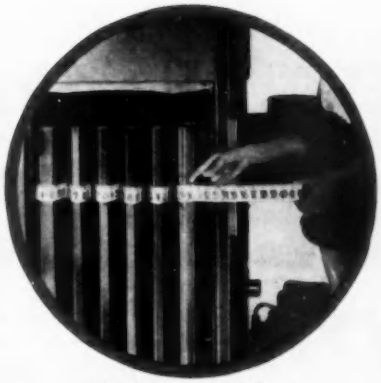


WESTINGHOUSE AIR HANDLING

J-80317

YOU CAN BE SURE ... IF IT'S Westinghouse

Heat Exchanger is only 17" straight across the face.



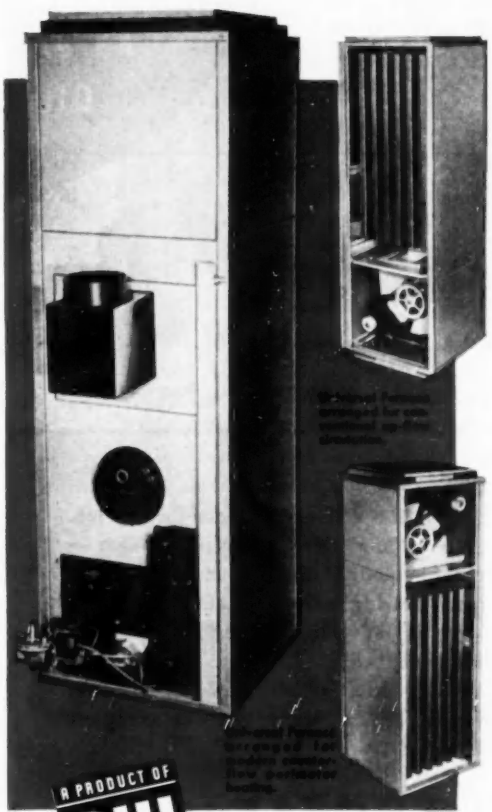
See how the tape follows the deep corrugations in the Exchanger.

42% MORE

HEATING AREA FROM THE SAME FLOOR SPACE

Actual heat transfer surface measures 30" wide on 3 sides.

WINKLER *Universal*



OIL AND GAS-FIRED FURNACES

UP-FLOW AND COUNTER-FLOW MODELS

You've never seen a more complete heating "package" than the Winkler Universal Winter Air Conditioner! Compactly and scientifically designed for more comfortable, more economical home heating. Everything included except ducts...for homes with or without basements. Easy to switch from one fuel to another.

Note particularly the Heat Exchanger. Its corrugated design nearly doubles the heat dissipating area...minimizes heat waste up the chimney. This design also permits expansion and contraction without noise.

The fan carries all moving parts in soft rubber for quiet, vibrationless operation. Note, too, that the filter frame can be installed in any of the five sides adjacent to the fan compartment —means less duct work and less labor.

Both Gas and Oil Burner Kits are pre-wired for quick connection to the pre-wired furnace—another labor-saving feature.

DISTRICT MANAGERS . . . DEALERS . . . DEALER'S SALESMEN WANTED!

This is your opportunity to join a successful organization with an amazing growth record. Winkler gives you complete instruction in successful selling and business management methods at the Winkler Training Institute—a school where dealers and their personnel are shown how to turn Winkler products into *profits!*

Write today for information on how to obtain a Winkler territory or Franchise.

A PRODUCT OF SW STEWART WARNER

STEWART-WARNER CORPORATION

U. S. MACHINE DIVISION • Dept. A-103 • LEBANON, IND.

• AUTOMATIC • WINKLER HEATING EQUIPMENT

NO SPARES . . . NO SPLITS but a

STRIKE EVERYTIME WITH MONCRIEF

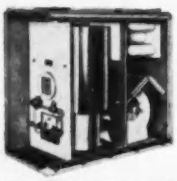
A Furnace for ANY Heating Installation

APPROVED for EITHER GAS or OIL

Winter . . . Summer Air Conditioner Heats in Winter Cools in Summer

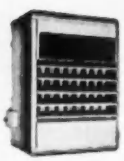
Counter-flow Units Approved for Either Gas or Oil

Basement Air Conditioning Units Approved for Either Gas or Oil



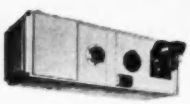
Gravity Furnaces Approved for Oil or Gas, Cast Iron or Steel

Utility Air Conditioning Unit Approved for Either Gas or Oil



Unit Heaters Gas Fired 4 Sizes 60,000 to 170,000 B.T.U.

Incinerators 2 Bu. Capacity With or Without Gas Burner



Horizontal Furnaces Gas and Oil Fired	65,000 and 85,000 Gas 84,000 and 123,000 Oil

Snap Lock Pipe Prefabricated Fittings

Why be on an average team and be satisfied with spares and splits and once in a blue moon get a strike? Join the Moncrief team where you have everything under control for a "strike" everytime.

No line of heating and year 'round cooling equipment offers the vast sales opportunity — profit opportunity that is available with Moncrief.

No line of heating equipment offers so complete a line as Moncrief — a furnace for *any* job.

When you sell Moncrief you sell high quality — the same high quality that has made Moncrief "tops" in the heating market for almost 60 years.

So don't be on the "spare" and "split" team — be on the Moncrief team.

See your Moncrief jobber, he's setting them up in the "STRIKE" alley. Get the complete Moncrief story.

THE HENRY FURNACE COMPANY

Medina, Ohio

HEATING AND AIR CONDITIONING UNITS — MONCRIEF — FURNACE PIPE AND FITTINGS

"TWO HEATING SEASONS AND NOT A SMUDGE ON CEILING OR WALLS,"

reports John J. Albert
Hobart Thomas Co.
Bethel, Connecticut

"EVERY HOME INSTALLATION of Kno-Draft Overhead Air Diffusers we've made," says Mr. Albert, "has brought owners' comments that this is the finest, most economical heating they've ever enjoyed.

"But what women especially like is the fact that Kno-Draft never smudges walls or ceilings. With conventional methods of warm air heating, the rising warm air is bound to darken ceiling and walls. Not so with Kno-Draft. We've had Kno-Draft Diffusers in use for two winters now and ceilings, walls and drapes are still clean and fresh.

"Aside from customer satisfaction we, as contractors, find that Kno-Draft Overhead Air Diffusers are easy and economical to install, requiring little preliminary engineering paper work. This means we can do a fast effective job and make a better profit."

Kno-Draft Overhead Air Diffusers are "catching on" everywhere. They're going into more and more individual homes and building developments. Mail the coupon for complete engineering details and cash in on this most revolutionary home heating advance of the century.

NOW AVAILABLE WITH INTEGRAL LIGHTING

You can now get Kno-Draft Overhead Air Diffusers with a handsome, efficient lamp as an integral part of the unit. Complete information on request.

CONNOR

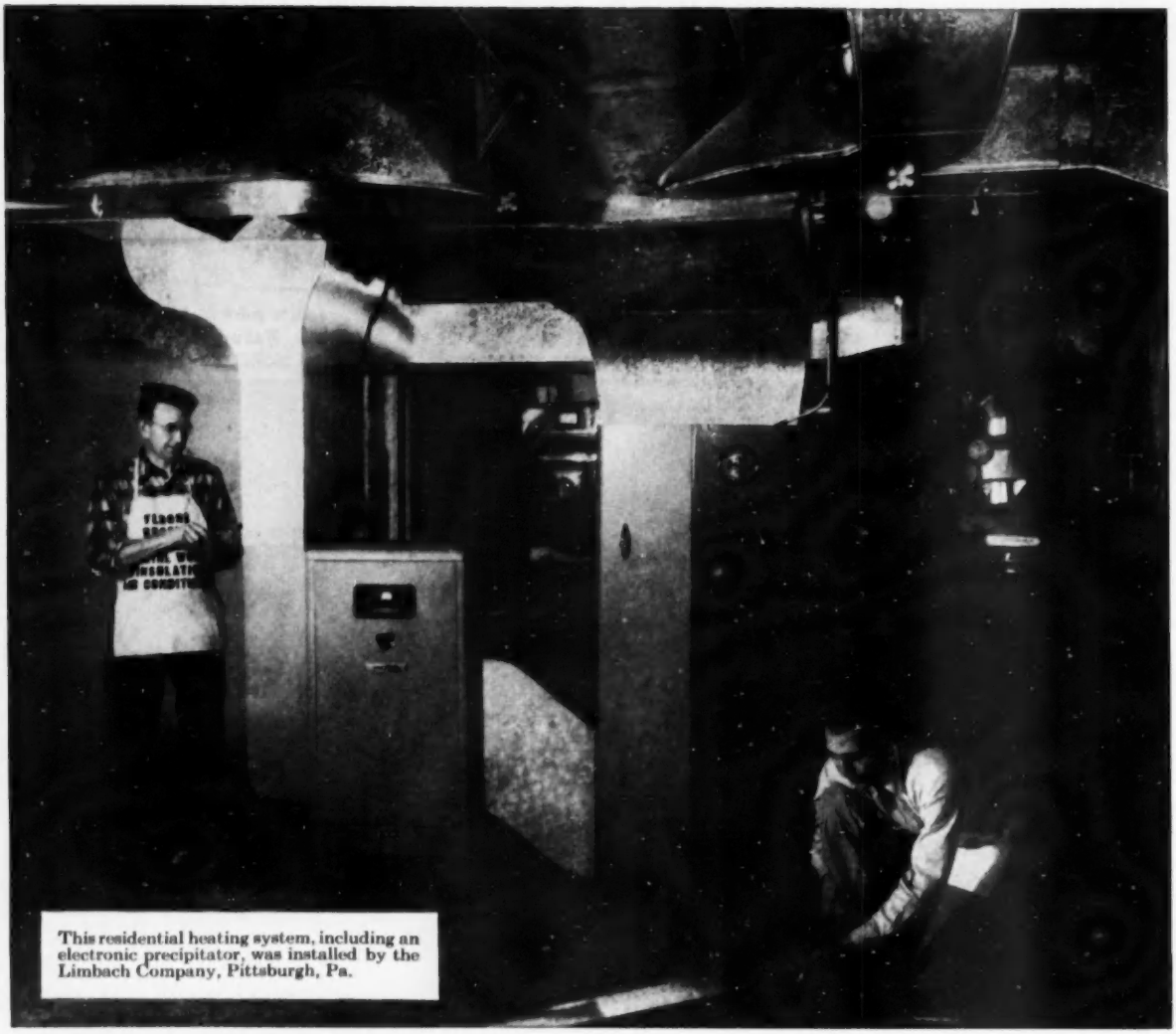
kno·draft®

residential air diffusers

CONNOR ENGINEERING CORP.
Dept. I-103, Danbury, Connecticut

Please send ( ) full information on Kno-Draft Overhead Air Diffusers; ( ) data and prices on the new Kno-Draft Integral Lighting Fixtures.

Name .....
Position .....
Company .....
Street .....
City ..... Zone ..... State .....



This residential heating system, including an electronic precipitator, was installed by the Limbach Company, Pittsburgh, Pa.

For tricky remodeling jobs . . . U·S·S Galvanized Steel Sheets

NEAT seams, tight joints and quality workmanship—on all sorts of new or modernization residential heating jobs—call for good sheets that handle easily, work up nicely. U·S·S Galvanized Sheets are uniform in ductility, flatness and surface finish; they make it easy to handle difficult shapes and angles on residential jobs like the one shown here.

You can bend, roll, cut or stamp these steel sheets in minimum time with satisfactory results. Soldering is no problem. And their tightly adhering zinc coating is highly resistant to cracking and flaking, assuring a long-lasting finish that contributes to the pleasing appearance and quality of every job you turn out.

U·S·S Galvanized Sheets are one of the best-known, most widely-used sheets in the industry. And the U·S·S trade-mark is your assurance of continuing dependable quality. Your customers know and appreciate the U·S·S name. It will pay you to take advantage of this widespread customer acceptance by using U·S·S Galvanized Steel Sheets on all your jobs.

UNITED STATES STEEL CORPORATION, PITTSBURGH · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S GALVANIZED STEEL SHEETS

USS

3-470

UNITED STATES STEEL

You get ALL these Features when you buy PET Drills!

If you want the *best* for your maintenance or production work, take an extra look at the PET Superduty Drill shown here. Check its features! Here's a drill that's made for heavy, continuous duty...with *plus* power per pound . . . built to *work* right and *handle* right on the job.

Normally you might expect to pay extra for such features—in the form of "optionals" that jack up your cost. But that's not true of PET Drills! All these features are standard in the PET Superduty line . . . *and they're available to you at a standard drill price!* That's why the coupon below can save money for you. For free catalog and name of your nearest PET distributor, *mail it today!*

NOW...you can get the RIGHT DRILL for YOUR job!

PET Superduty Drills are available in 54 distinct models and 3 capacities: ¼", ⅜" and ½". Your choice of pistol or saw-type grip. With such a broad line, you don't have to compromise on a drill that's "almost" right! You can choose *exactly* the drill you need for your job. The PET Superduty line includes drills meeting U. S. Government and military specifications.

PET® POWER TOOLS

Plus Power per Pound

PORTABLE ELECTRIC TOOLS, INC.

320 West 83rd Street, Chicago 20, Illinois

In Canada: Portable Electric Tools, Ltd., 452 Birchmount Road, Toronto 13, Ontario, Canada

MAIL COUPON FOR FULL INFORMATION

PORTABLE ELECTRIC TOOLS, INC. AA-103
320 W. 83rd St., Chicago 20, Ill.

Gentlemen: Please send us free copy of your PET Superduty catalog, and name of nearest distributor.

*Name*_____ *Title*_____

*Company*_____

*Address*_____

*City*_____ *State*_____

EXTREMELY SIMPLE DESIGN makes this control a "pleasure to work with." Plastic covers on timer and relay keep out dirt, help prevent damage. Simplified flange, rubber grommet for service wiring, ample wiring room—all make mounting easy.

EASY TO INSTALL!

New G-E Stack Switch for any oil burner

Here's a control that's designed for *fast* installation, minimum service. It is the new G-E master control with helix ("stack switch") for regular stack mounting . . . One of the new simplified G-E oil burner controls. Here's why installation and servicemen like it the minute they see it...

NO LEVELING, NO ADJUSTMENTS, NO CALL-BACKS

Just install this control in the stack with the simplified mounting flange, set the knob on "cold" side, and forget it. *You don't have to level it.* It operates on any 50 to 100 degree temperature *change*—and *automatically adjusts itself* to any stack operating temperature up to 1000 degrees F. This means callbacks for field adjustments are not necessary.

FAST ACTING, MAXIMUM SAFETY

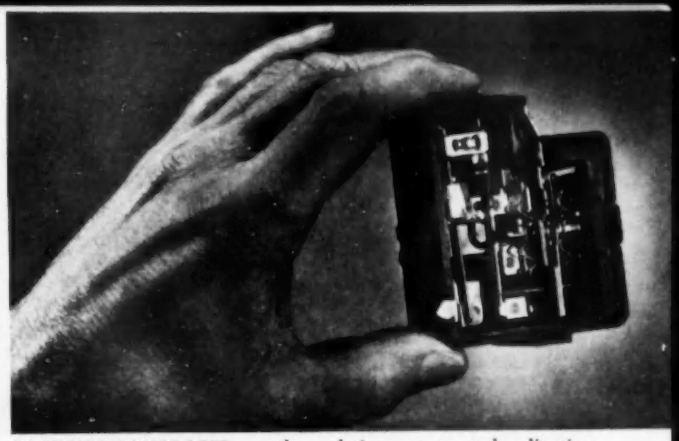
This control is fast-acting on flame failure, because timing is preset at the factory and does not vary with, or depend on stack temperature. The control is set for much faster, closer control of lockout of shutdown timing than other controls—this gives maximum safety.

LIGHTWEIGHT BUT STRONG

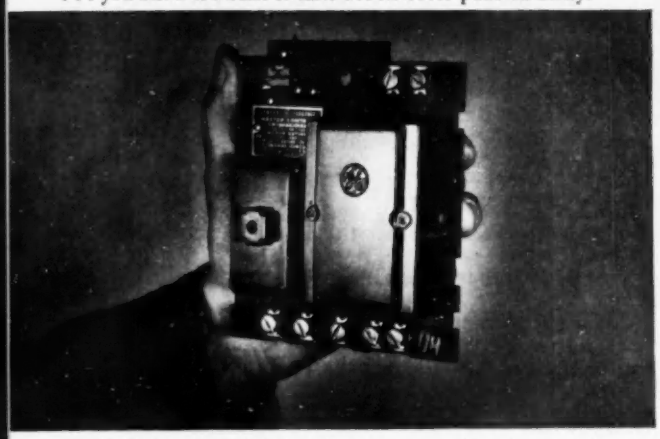
This control will stand plenty of abuse, even though it's lighter in weight. The case and parts are of heavier, thicker materials than other controls—the reduced weight is achieved by reducing the number of parts and simplifying construction. Fewer parts mean fewer possible troubles—No special handling needed. For other details, look at the illustrations on these pages, then see your local G-E Apparatus Sales Office. Or write for Bulletin GED-1837, or Service Manual GEH-1907. Address Section 740-21, General Electric Company, Schenectady 5, New York.

GENERAL ELECTRIC

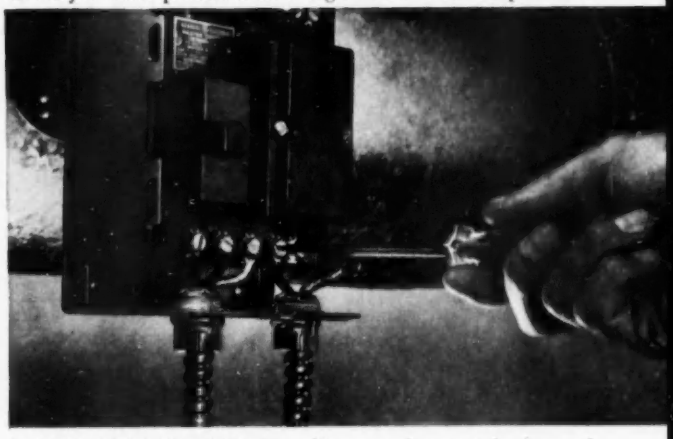
RUGGED CONSTRUCTION . . . Hold this control in your hands . . . you know it's built to last! Yet its cover pulls off easily.



FACTORY CALIBRATED . . . thermal timer *never* needs adjusting on the job. Gives positive lockout regardless of stack temperature.



UNIT TYPE ASSEMBLY includes new combination transformer relay. Same core serves as transformer and relay armature.



PLENTY OF WIRING SPACE . . . No exposed parts to be damaged by slipping screwdriver. Terminals marked to prevent error.

EASY TO SERVICE!

cuts installation time, saves service calls!

OIL BURNER CONTROLS

The Appliance Control Department of General Electric is devoted exclusively to developing and producing a complete line of controls for appliance and oil-heating manufacturers.

NiAGARA UNITS *Simplify*

Year-Round Air Conditioning Installations for Homes ANYWHERE

Warm Air Furnaces . . . Refrigerated-Air Home Coolers

With Niagara's extensive lines of gas, oil and coal furnaces and electric cooling units you can ideally meet the requirements for year-round air conditioning in **any** home — **anywhere.** By combining a Niagara home-cooling unit with any Niagara forced air furnace you provide the home owner with circulating warm air in the winter and circulating cool, dehumidified air in the summer. This is the most simple, most economical, most effective way of providing **year-round** air conditioning.

To meet air conditioning requirements for any home, Niagara gives you:

For Homes with Basements • GAS-FIRED FURNACES • For Homes without Basements

Series 50 AC CAST IRON

Series 40 AC STEEL

Niagara Series 50 furnaces are equipped with the exclusive Niagara cast-iron heat exchanger, famous for dependable long-time operation with low gas bills. Deluxe Series 50 AC models have 3-speed direct-drive blower — standard models, single-speed, belt-drive blower. Also available in gravity models. Sizes range from 75,000 to 180,000 BTU input.

Niagara Series 40 furnaces have exclusive Niagara-made alloy steel heat exchangers. Blower-filter unit of AC models may be installed on either side (shown above at left side of heating unit). Also available in gravity models. Sizes from 60,000 to 140,000 BTU input.

Series 40 DFAC Down-Flow

Series 40 VAC Hi-Boy

The series 40 line of high-boy winter air conditioners includes down-flow types for perimeter heating systems, and conventional up-flow units. Exclusive Niagara-made alloy steel heat exchanger. Sizes from 50,000 to 115,000 BTU input.

Model 60-75 DFAC

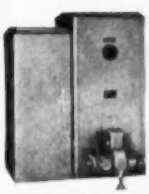
Model 60-75 VAC

OIL-GAS CONVERTIBLE: For Homes with or without Basements

Designed for the economical use of oil, Niagara Series 60 convertible furnaces are exceptionally compact and can easily be converted to gas when desired — with a Niagara gas conversion burner. Equipped with exclusive Niagara-made steel heat exchanger of new, space-saving, rectangular design. Line includes vertical down-flow and up-flow complete winter air conditioners.

The blower-filter unit of 60 AC models may be installed on either side. Gravity models also available.

Series 30 furnaces are complete winter air conditioners of the basement or "low-boy" type. Deluxe models have 3-speed direct-drive blowers; standard, single-speed, belt-drive. Sizes from 105,000 to 210,000 BTU.



Model 60-75 AC

Series 30 AC

Coal-Fired Furnaces

Efficient, durable cast-iron Niagara coal furnaces are available in three styles: Square cabinet and round casing gravity furnaces, and rectangular forced-air furnaces.

Coal-Fired Forced-Air

Coal-Fired Gravity

. . . and Summer Air Conditioning in its Most Effective, Economical Form

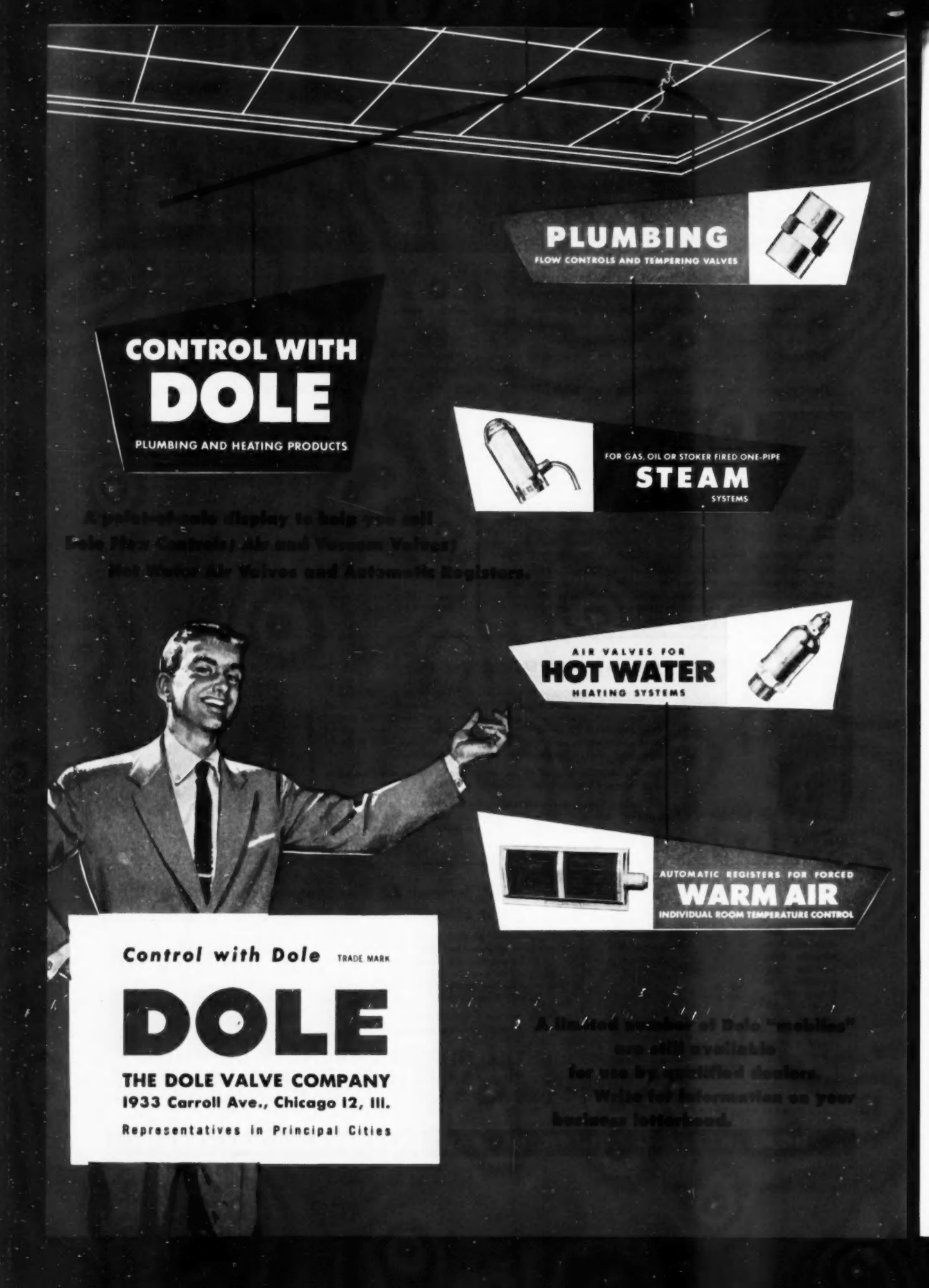
Niagara refrigerated-air Home-Cooling Units make the supreme comforts of year-round air conditioning practical and economical in all homes that are heated by forced-air systems. The units are designed to use the blower, filter and ductwork of the heating system for the distribution of cooled air in the summer. Units of 2-ton and 3-ton capacity occupy less than 6 sq. ft. of floor space.

Write for the complete Niagara story — the outstanding money-making and prestige-building lines for heating contractors.

Niagara Cooler NC-2

THE NIAGARA FURNACE DIVISION
THE FOREST CITY FOUNDRIES COMPANY
2500 West 27th St. • Cleveland 13, Ohio

HOME-HEATING EQUIPMENT MANUFACTURERS SINCE 1890


PLUMBING
FLOW CONTROLS AND TEMPERING VALVES
CONTROL WITH
DOLE
PLUMBING AND HEATING PRODUCTS
FOR GAS, OIL OR STOKER FIRED ONE-PIPE
STEAM
SYSTEMS
AIR VALVES FOR
HOT WATER
HEATING SYSTEMS
AUTOMATIC REGISTERS FOR FORCED
WARM AIR
INDIVIDUAL ROOM TEMPERATURE CONTROL
Control with Dole TRADE MARK
DOLE
THE DOLE VALVE COMPANY
1933 Carroll Ave., Chicago 12, Ill.
Representatives in Principal Cities

Plan Warm Air Short Courses

PLANS AND DATES for the short course program of the National Warm Air Heating and Air Conditioning Association were recently announced after the short course committee, headed by Bruce McLouth, held its early fall session in Chicago. The committee plans to furnish each student with a complete set of all the manuals published by NWAHACA (in a ring binder). Copies of all work sheets also will be furnished. A program for the course has been outlined:

First Morning

9:00 Registration
10:15 Welcome address and introductions
10:30 Purpose and objectives of short course
11:15 Review of classroom problems
11:45 Lunch

First Afternoon

1:15 - 5:00 Classes
6:00 Dinner
Evening open to school committee

Second Morning

8:00 - 11:45 Classes

Second Afternoon

1:15 - 5:00 Classes
6:00 Banquet (speaker, entertainment)

Third Morning

8:00 - 11:45 Classes

Third Afternoon

1:15 - 5:00 Classes
6:00 Dinner
General discussion panel

Fourth Morning

8:00 - 11:45 Classes
12:00 Luncheon (speaker, presentation of certificates)
2:00 Conference closes

The dates for the four day course were set as:

Oklahoma A & M College.....Feb. 15, 16, 17, 18.
Purdue University.....Mar. 3, 4, 5, 6.
Michigan State College.....Mar. 29, 30, 31, Apr. 1
Penn State College.....April 14, 15, 16, 17.
Iowa State College.....Apr. 21, 22, 23, 24.

Dean L. G. Miller has announced that he will attend each of the short courses and will speak on the subject of school house heating with warm air.

Study Furnace Clearance Changes

THE SHEET METAL Contractors National Association is arranging to conduct tests on furnace clearances at the School of Engineering, Michigan State College, for obtaining data in support of changes in clearance recommendations being urged by the association. Results will be presented to the National Fire Prevention Association. SMCNA is asking NFPA to approve the suggested changes in the revised edition of the National Bureau of Fire Underwriters' pamphlet 90.

NEW YORK'S first aluminum-clad office building, framed by the Chrysler tower *(left)* and the News Building, is scheduled for November occupancy

Skyscraper Sheathed in Aluminum

THE WORK of enclosing the 99 Park Avenue Building in New York City with an aluminum sheath was accomplished in six and one-half working days. A total of 1300 prefabricated panels was installed on the 26 story office building. No exterior scaffolding was used, all work being done from within the building.

NHWA Surveys Operating Costs

THE NATIONAL Heating Wholesalers Association recently completed tabulation of a questionnaire sent members regarding the operating costs of doing business for the first six months of 1953. The dollar volume of business done during the test period was used to form three gen-

WHAT'S HAPPENING —

(Continued from preceding page)

eral classifications. These classifications are: over $250,000 but less than $500,000; over $500,000 but less than $1,000,000; and over $1,000,000.

The questionnaire was broken into two parts — schedule A and schedule B. Schedule A was confined to the entire costs of operating the business whereas schedule B was a breakdown of sales volume into the relation of sales per employee, inventory turnover, accounts receivable and other related subjects.

Where too few returns were available to formulate a satisfactory average, no report was tabulated, as was the case with the "Over $1,000,000" group of schedule A.

The following tabulation will show heating wholesalers how their operating costs may compare with the figure shown as average for those members of the NHWA who answered the questionnaire.

For businesses doing over $250,000 but less than $500,000:

Dollar volume of net sales per employee: high, $9,247.97; low, $7,518.77; average, $7,864.89

Dollar volume of net sales per salesman: high, $27,743.92; low, $10,433.14; average $19,630.39

Accounts receivable turnover: high, 84 days; low, 1.3 days; average, 39.8 days

Inventory changes: high, 1.621 per cent; low, 0.276 per cent; average, 1.256 per cent

Capital ratio to sales volume: high, 4.451 per cent; low, 0.607 per cent; average, 2.509 per cent

For businesses doing over $500,000 but less than $1,000,000:

Dollar volume of net sales per employee: high, $65,000; low, $6,277.20; average, $35,999.53

Dollar volume of net sales per salesman: high, $197,102; low, $70,472.75; average, $122,308.68

Accounts receivable turnover: high, 90 days; low, 41 days, average 60.5 days

Inventory changes: high, 0.959 per cent; low, 0.810 per cent; average, 0.887 per cent

Capital ratio to sales volume: high, 2.741 per cent; low, 0.655 per cent; average, 1.825 per cent

For businesses doing over $1,000,000:

Dollar volume of net sales per employee: high, $48,000; low, $8,474.29; average, $28,602.29

Dollar volume of net sales per salesman: high, $207,296.51; low, $25,648.75; average, $110,981.75

Accounts receivable turnover: high, 75 days; low, 24 days; average, 53 days

Inventory changes: high, 5.86 per cent; low, 0.904 per cent; average 3.588 per cent

Capital ratio to sales volume: high, 5.015 per cent; low, 0.669 per cent; average, 3.351 per cent

The results of a third questionnaire have also been reported to the membership of NHWA. This questionnaire had to do with the compensation paid to salesmen. The salesmen were classified as receiving compensation by either salary, commission or salary and commission basis.

A summary of this report would indicate that salaried salesmen covering a city territory received an average of $361.93 monthly, with the highest salary paid amounting to $575.00 and the lowest $288.00. Country salesmen received an average salary of $380.60, with a maximum of $650 and a minimum of $288.00. Car expense for city salesmen averaged $0.066 per mile whereas the country salesmen received $0.062 per mile as an average.

It was found that city salesmen average 44 calls per week with 90 being the highest number made and 30 the lowest. The country salesmen averaged 41 calls per week with a high of 90 and a low of 20.

July Construction Highest of Year

THE JULY TOTAL of construction contract awards in the 37 eastern states was higher than for any previous month of 1953, according to F. W. Dodge reports. The total was $1,793,342,000 as compared with $1,115,509,000 in June and $1,511,285,000 in July 1952. Contributing to the July rise were the highest monthly awards for commercial building and for educational and science building ever recorded since Dodge started to compile construction statistics in 1919.

The July residential total of $653,407,000 was the second highest monthly residential total this year, surpassed only by April with $673,887,000. It was surpassed in 1952 only by April and May.

New Ruling Liberalizes Home Repairs

TO ENCOURAGE more extensive reconditioning of trade-in houses, the FHA insured mortgage plan has been liberalized to assist in financing repairs to older houses as well as refinancing the existing mortgage on them.

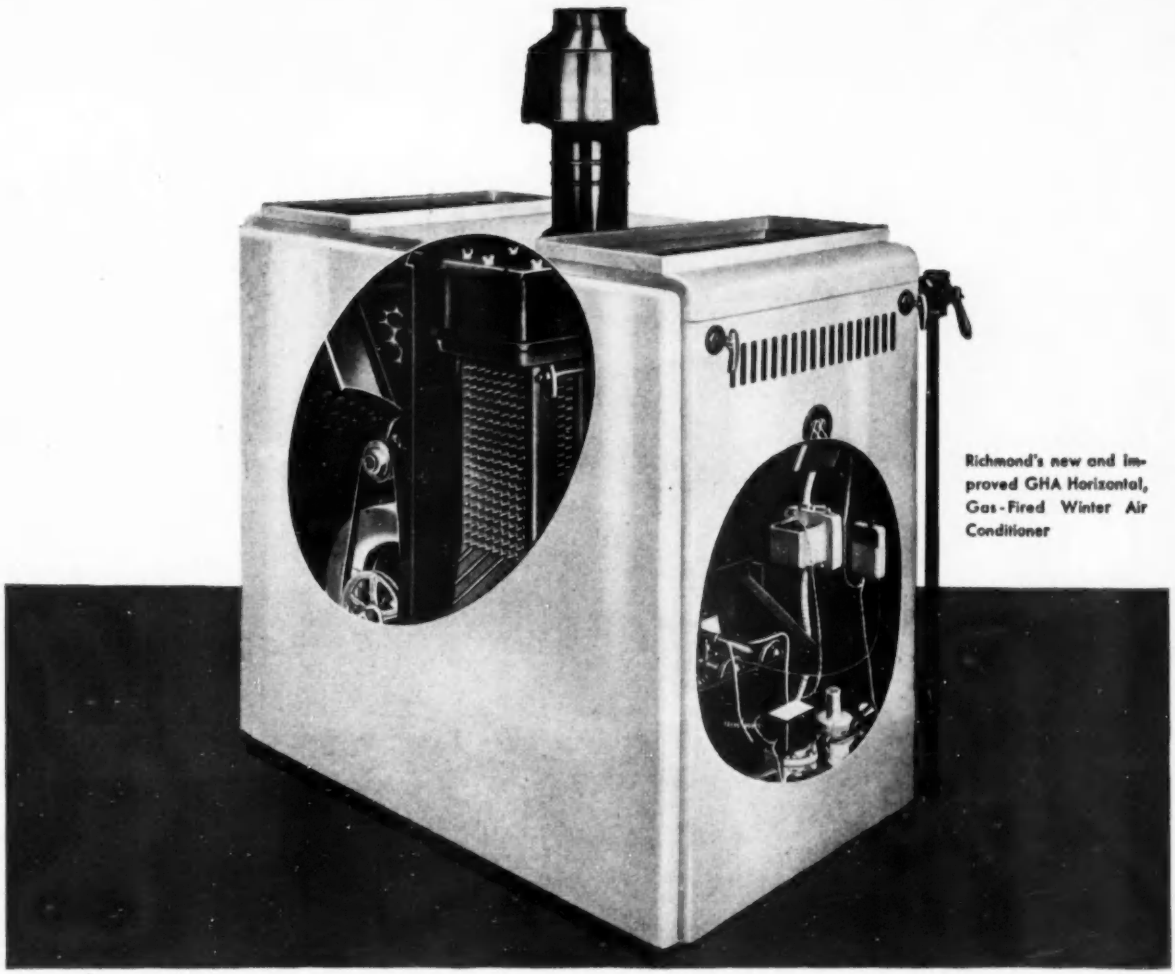
Under FHA's new ruling, the builder taking in an old house as a trade-in on a new home may get a firm commitment from the FHA to insure 80 per cent of the first $7000 of value plus 60 per cent of the balance of the valuation. The total mortgage amount may not exceed $10,400 and is further limited to the amount of the existing mortgage plus the cost of the proposed repairs, minus any cash received by the building in the trade-in transaction.

OHI Fall Heating Courses Begin

THE OIL HEAT Institute of New England began its ninth annual service school on September 14. Courses will run through November 20. The school is designed for service men, service managers, salesmen, and dealers.

Dehumidifier Shipments Up

FIGURES showing the number of refrigeration type mechanical dehumidifiers shipped by the industry in 1952 and 1951, which were reported in August, were in error, according to a correction bulletin recently received from the Bureau of the Census. The amended figures show that 87,452 mechanical dehumidifiers valued at $6,295,000 were shipped by 16 companies in 1952. The corresponding figures for 1951 are 55,242 units valued at $3,853,000.



Richmond's new and improved GHA Horizontal, Gas-Fired Winter Air Conditioner

A Fine Unit Now Made Even Finer!

Now the popular Richmond GHA will deliver more heat more efficiently than ever before. Thanks to a new sectionalized heating element, with easily removable individual burners for each replaceable section . . . all designed to produce maximum heating performance.

Other GHA features include: cast-iron heat exchanger for longer life and greater resistance to corrosion . . . new single-unit design for installation on combustible floors . . . handsome white enamel jacket . . . full range of sizes (single: 75,000 to 175,000 input BTU/hr.; twin: 200,000 to 300,000 input BTU/hr.) . . . fully approved by the AGA.

For small, medium and large homes where quality is desired, use this new and improved GHA unit.

RICHMOND RR PLUMBING & HEATING

RICHMOND

RICHMOND RADIATOR CO.—AFFILIATE OF REYNOLDS METALS CO.

Richmond Radiator Company
Box 111, Metuchen, New Jersey
Please send me more information and literature on the Richmond GHA Unit. No obligation, of course.

NAME .....

COMPANY .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

We are ☐ plumbing wholesalers ☐ plumbing contractors ☐ building contractors.

Show the Armco Triangle to gain customer-confidence

When you see the Armco stencil on your stainless sheets *you* know that you have top quality metal. But, your customers won't know it is Armco Stainless unless you tell them.

Assurance of Quality

Show your customers the familiar Armco triangle trademark on the back side of your work, and on the sheets you have in stock. They will be interested because over the years millions of people have learned to recognize the Armco trademark as assurance of metal quality in products they buy.

Use the Armco Label

If you are making standard stock items of Armco Stainless Steel there's another way of telling the quality material story. Put an Armco label on every piece of finished equipment and let this "silent salesman" work for you. There is wide recognition of the quality associated with the Armco name. Your Armco Distributor will be glad to supply you with gummed labels. Ask him too about the stainless plates that can be fastened permanently to larger pieces of equipment.

ARMCO STEEL CORPORATION

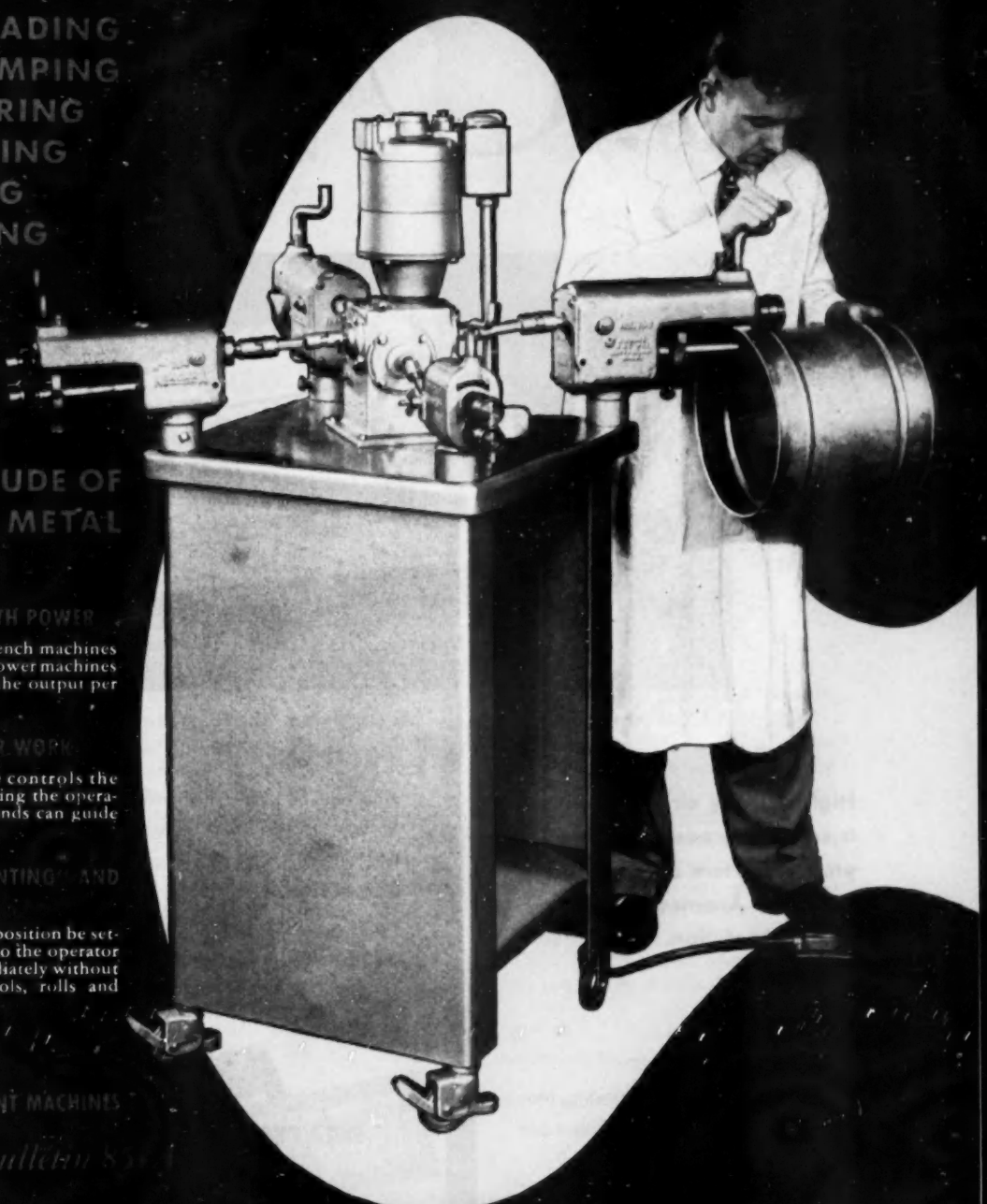
4673 CURTIS STREET, MIDDLETOWN, OHIO
EXPORT: THE ARMCO INTERNATIONAL CORPORATION

ARMCO

NIAGARA PRESENTS

Multi-Drive Power Table

for BEADING
CRIMPING
BURRING
TURNING
WIRING
FLANGING
ELBOW-EDGING
FURNACE-COLLAR EDGING
AND A MULTITUDE OF OTHER SHEET METAL OPERATIONS



- **MORE PRODUCTION WITH POWER**

  Low cost hand operated bench machines are instantly converted to power machines that will give many times the output per hour for each machine.

- **FREES BOTH HANDS FOR WORK**

  The electric foot treadle controls the operation of the rolls, freeing the operator's arms so that both hands can guide the work.

- **ELIMINATES "TOOL HUNTING" AND "TOOL SETTING"**

  We recommend that each position be set-up for a certain operation so the operator can start to WORK immediately without wasting time hunting tools, rolls and gages.

- **PORTABLE—COMPACT**

- **MOTORIZES YOUR PRESENT MACHINES**

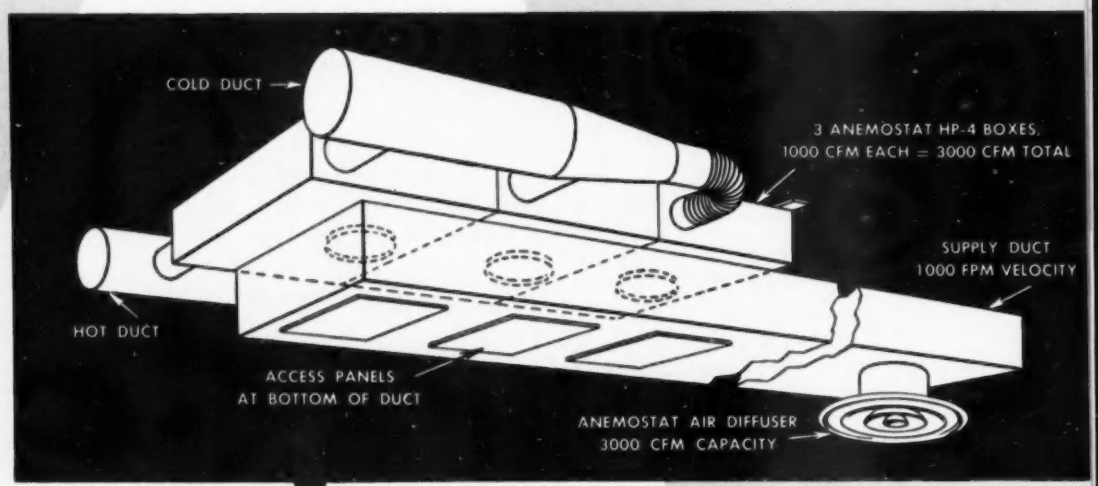
Write for New Bulletin S-1

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

America's Most Complete Line Presses, Shears, Machines and Tools for Sheet Metal Work

DISTRICT OFFICES: DETROIT • CLEVELAND • NEW YORK

High Velocity with Unlimited Capacity



High Velocity air conditioning is constantly posing new problems. Here is one of many for which Anemostat has a practical solution.

PROBLEM:

How can you handle unlimited volumes of air from a single air diffuser on a High Velocity single or dual duct system?

SOLUTION:

Use 3 series HP-4 High Velocity Units in tandem connected to an Anemostat Air Diffuser.

In High Velocity installations, too, "When Anemostat Air Diffusers are in sight the system is right."

ANEMOSTAT®

DRAFTLESS *Aspirating* **AIR DIFFUSERS**

ANEMOSTAT CORPORATION OF AMERICA

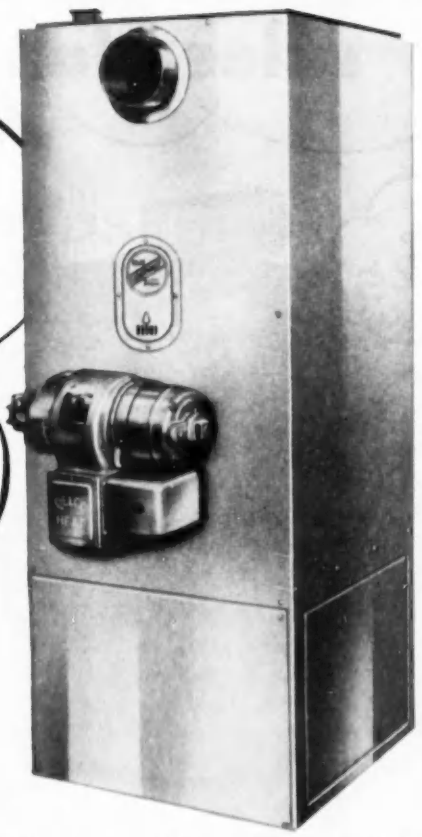
10 EAST 39th STREET, NEW YORK 16, N. Y.

REPRESENTATIVES IN PRINCIPAL CITIES

"No Air Conditioning System Is Better Than Its Air Distribution"

Lowest priced Delco forced air furnace ever made means profit sales to builders!

NEW **DELCO-HEAT**
OIL-FIRED FORCED AIR FURNACE
FEATURES NEW, MODERN,
MASS PRODUCTION
WRAP-AROUND DESIGN FOR
LOWEST BIDDING PRICE
EVER OFFERED
DEALERS!



Costly frills and extras
eliminated without sacrificing quality

Here's the Delco-Heat answer to builders' need for a lower-priced heating plant that will permit them to make profitable installations and offset rising costs. With this unit you have a real sales-making bidding price for builders, with proper profits for you, and you can still guarantee real comfort, economy and service-free operation.

The value-leader OBC75-H Oil-Fired Conditionair has exclusive new wrap-around steel cabinet with Delco Green enamel finish. The 16 ga. steel Heat Transfer Unit is seam welded to eliminate combustion leaks. The Circle-Air Radiator adds an extra heating surface—improves efficiency. Other great Delco features are the Quik-Action stainless steel combustion chamber; Delco-Heat Pressure Oil Burner powered by the vibration-free Rigidframe Motor; Centrifugal Blower; replaceable air filter; wrap-around wipe sheets; knockouts in side panels that permit installation of filter at either position; and base pan with knockout for floor return.

Similar in every detail, the new Model GBC90-H also meets the builder demand for a value-leader Gas-Fired Conditionair. Both models are shipped assembled for easy installation.

For more information, write or wire: Delco Appliance Division, Dept. AA, General Motors Corp., Rochester 1, N.Y. In Canada: Delco-Heat, Toronto 13, Ontario.

For a good deal-
DEAL WITH DELCO

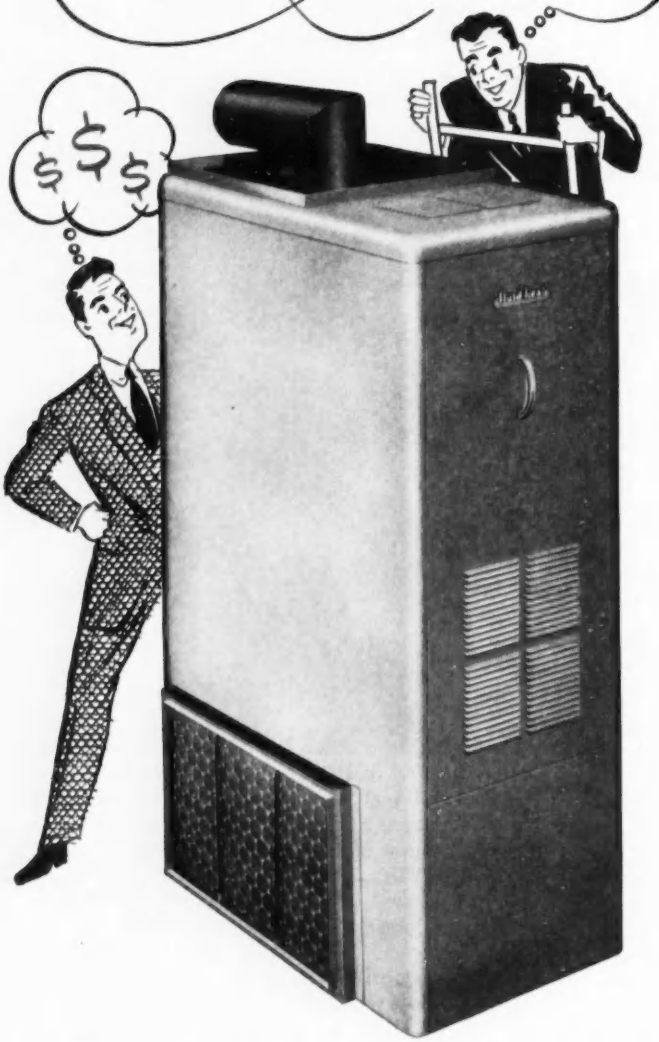
GENERAL MOTORS
DELCO-HEAT

General Motors Engineering
Delco Production Skill

...your keys to Sales Success

. . . a complete line of automatic oil- and gas-fired conversion burners, Conditionair forced warm air furnaces, boilers, and electric water systems

This NEW fluid heat is a "natural" sales blazer...



HERE IT IS, the newest addition to the famous Fluid Heat line, the SU-75 . . . another "natural" sales blazer . . . another profit maker. Three features make this new SU-75 a "natural" for new homes or for modernizing many existing heating systems.

FIRST is its design. Now, with the SU-75, installation is easier and less costly in any location. Design permits flue to be mounted in 8 positions. Filters can be mounted on bottom or either side. Units are accepted for "Zero Clearance." Two unit capacities are available . . . 75,000 and 100,000 BTUs/hr. All in all, the SU-75 makes for unlimited location flexibility. Shipped completely assembled and wired. Every home owner and builder is your likely prospect.

SECOND is Fluid Heat's beauty. Eye-catching, colorful appearance . . . all round corner construction . . . unit compactness . . . here are real selling points for you in contacting builders, because, in turn, these points are selling points for them. Make customers out of home owners and home builders, alike.

THIRD is economy. Fluid Heat's exclusive "Dua-Flo" Combustion Chamber is the latest and most advanced in design. Flame direction up and down, plus all around heat absorption surface means that Fluid Heat can offer the utmost in economy . . . the most heat from every bit of fuel. You know what a sales-clincher that is with today's cost-minded buyers.

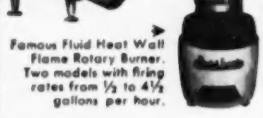
There it is, another money-making item. And a worthy companion to all the other units in the Fluid Heat line. So make the most of it. Feature the SU-75. And show, talk, sell the entire Fluid Heat line. And remember, Fluid Heat is constantly pre-selling your prospects through national advertising. Just watch your business and profits grow.

For full details on the new SU-75, write to the address below.

fluid heat
AUTOMATIC HEATING EQUIPMENT
"WORLD'S ECONOMY CHAMPION"
Division of ANCHOR POST PRODUCTS, INC.
6720 Eastern Avenue, Baltimore 24, Maryland
also Colbaugh Street, Red Oak, Iowa

A FLUID HEAT UNIT FOR EVERY HEATING PROBLEM

Famous Fluid Heat Pressure Burners. Four models, with firing rates from 7/10 to 12 gallons per hour.



Famous Fluid Heat Wall Flame Rotary Burner. Two models with firing rates from ½ to 4½ gallons per hour.

OIL-FIRED UNITS

Famous Fluid Heat Boiler Burner Units. Six models, rated from 300 to 1090 sq. ft. of standing steam.

Famous Fluid Heat Warm Air Furnaces. Seven models, from 70,000 to 335,000 B.T.U. per hour.

GAS-FIRED UNITS

New Fluid Heat Gas-Fired Warm Air Furnaces with rated inputs of 70,000 to 140,000 B.T.U. per hour.

Single-port, self-piloting Fluid Heat Gas Conversion Burners. Rated inputs of 75,000 to 300,000 B.T.U. per hour.

Arnold Kruckman's

Washington Letter

When Do Title I Loans Cover Cooling Installations?

RECENTLY THE Federal Housing Administration issued Bulletin No. ME-10, covering requirements for buildings applying for mortgage insurance, under Title I loans, where the cost of cooling equipment is to be included in the mortgage. (ME-10 also applies to Title II loans).

The covering letter that accompanies ME-10 is known as TI-100. This is the regulation which places restrictions upon the installation of air conditioning equipment under Title I loans. It is considered by a number of factors in the air conditioning industry to be quite restrictive because the regulations, it is felt, do not agree (in several instances) with such research results as those obtained both in actual field tests and experimental tests conducted at the University of Illinois in the cooperative research program with the National Warm Air Heating and Air Conditioning Association.

Associations within the air conditioning industry believe that since some of the requirements are too severe, modifications should be made in ME-10 and its covering letter, TI-100, to make it possible for more purchasers of air conditioned homes to obtain FHA approval for Title I loans. These groups believe that such specifications as the specific inside dry bulb temperatures and relative humidities which are required under varying outside air conditions cannot be met, unless overly elaborate control systems and other auxiliary equipment are used. The addition of such extra equipment would increase the cost of air cooling equipment beyond the price that the public is willing to pay for residential cooling, it is felt. The equipment needed to guarantee the maintenance of specific inside air conditions might include outside anticipating thermostats, reheat coils, face and bypass dampers, timers, motorized dampers and many other electrical or pneumatic controls.

Other revisions favored by these groups have to do with the limitations on sound and vibration noises, insulation and vapor barriers, condensation removal and the approximate operating costs quoted. These requirements vary considerably within the jurisdiction of local officers of the FHA, thus making it impractical to set up the requirements for an area.

Letter Summarizes Criteria

Covering letter TI-100 is addressed to all qualified Title I lending institutions. The subject is defined as: "Criteria for determining the eligibility of air cooling systems for Title I financing." The criteria listed apply equally to mechanical refrigeration systems and to evaporative cooling systems. The letter states:

"To be eligible for Title I financing:

"a) The installation must cool the living room of the home and at least one bedroom. A loan to finance the cost of cooling only one room is not eligible.

"b) The cooled air must be distributed to the living room and bedroom by a permanently installed system of ducts.

"c) The cooling unit shall not be located within the space being cooled.

"d) The loan file must contain information clearly showing compliance with the foregoing requirements.

"A loan is not eligible for insurance if it is for the purpose of financing:

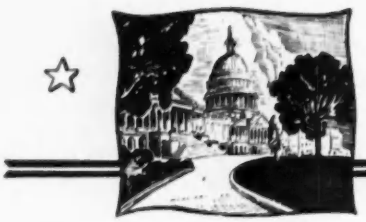
"a) Window-type air cooling units, regardless of design or method of installation.

"b) Self-contained, console, or 'packaged' units designed or installed to operate without ducts.

"c) The usual type of installation in a structure used for commercial, industrial or professional activities, since experience indicates that installations in structures other than homes are generally found to be within the category of trade fixtures and therefore not eligible. In the event an institution receives an application for a loan to finance a commercial system which it believes is eligible, it may submit the matter to Washington with full information, including plans and specifications.

Lending Institutions Responsible

"This letter shall serve as notice that henceforth the insured institution will be held responsible for determining that an air cooling installation meets the stipulated



Washington Letter

requirements prior to disbursing the proceeds of the loan. Accordingly, either the credit application or the dealer's contract or sales agreement must clearly show the total number of rooms in the house and designate the rooms that will be served by permanently installed ducts. The contract must identify the air cooling unit by make, model number and capacity, and include a breakdown of the cost of the job, showing separately the price of the unit, cost of installing the unit, and cost of ducts.

"Since many new dealers are entering the home air conditioning field, lending institutions should make certain that these dealers are reliable and qualified to do the work and to extend proper service. Lenders are urged to make inspections to verify that the equipment is properly installed and operates satisfactorily. Further checks should be made to assure that the jobs are not overpriced. It should be remembered that installations which do not work satisfactorily, or which are overpriced will lead to excessive defaults and that financing such installations will reflect adversely upon the lending institution."

This letter is signed by Arthur J. Frentz, assistant commissioner in FHA.

Many Industry Objections

Manufacturers of all kinds of equipment vigorously object to restrictions imposed on the types of equipment acceptable for installations which may be covered by FHA Title I loans. The industry maintains that so long as an installation is safe and has functioned satisfactorily over a decisive period of time the customer should be permitted to make a choice. The industry sharply opposes the kind of regulation that prohibits "freedom of choice."

L. G. Haeger, director of the technical and research department of the National Association of Home Builders, feels that Bulletin ME-10 needs revision. He suggests that it should reflect better engineering study, and that there should be in the estimates of costs some consideration of the monthly income of the family, which is now lacking. He points out that the clause covering warranty does not guarantee the operation of the installation, but simply guarantees replacement of defective parts. He suggests that some of the regulation is unworkable the way it is written, and that some of the problems, such as those concerning sound and vibration, are far more complicated than is suggested by the regulation itself.

FHA Asks for Suggestions

"Compliance discussions affecting the air cooling of residences have virtually not yet occurred", said T. E. Landvoigt, the mechanical engineer for FHA directly in charge of regulations covering cooling requirements. "We have requested the industry to submit its idea of basic requirements, in order that we may set up the proper protective standards for the householder, both in dealing with the financial institution and in dealing with those who supply the air cooling installations. Categorically, I would say that the industry has never yet supplied a clear statement of what it considers basic standards. I am inclined to say that I have not heard anything except rumors of opposition, and have had vague statements about the opposition and the objections to the standards and regulations that we have set up.

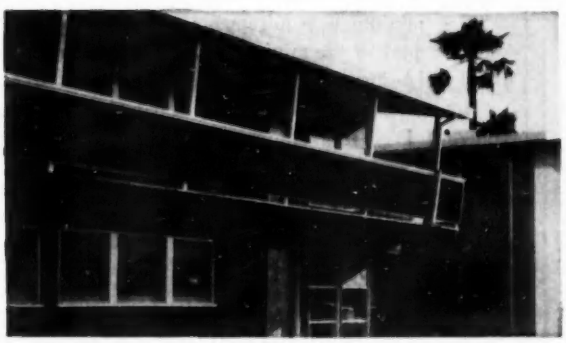
"As a matter of fact, for the past few years the situation in regard to residential air cooling installations, in many instances, has become pure and wild propaganda. Our Letter TI-100 was made necessary by the fact that inexperienced and unqualified persons entered the field of supplying air conditioning equipment. For a while it looked as though some of these people were putting together some parts and calling them an air conditioning system. Of course, many of these installations were practically unworkable, and the purchaser lost his investment. To all intents and purposes we have had the same situation as we had when the installation of oil burners was experiencing a similar growth. It is this condition that we are trying to overcome.

"I wish to emphasize, and reiterate, that we welcome constructive criticism in order that we may set up standards that are fair to the manufacturer and the dealer as well as to the householder. I also wish to stress that thus far no questions about our regulations have been submitted, so far as I know. I will be glad to meet any representatives of the industry and to work with them to find the answers to the problems that beset them and the householder. We don't presume to know all the answers. The problems are in the general engineering field and we wish to cooperate with the industry to find

CHEM-O-GLAS

NEW SHATTERPROOF TRANSLUCENT REINFORCED GLASS-FIBER BUILDING PANELS FOR STRUCTURAL AND DECORATIVE USES WITH EXCLUSIVE, DISTINCTIVE RIBBED DESIGN SO EASY TO INSTALL.

See the new shades – "FROSTED GREEN" and "COPPERGLO" – especially created for patio use where glare and heat are undesirable. Give restful, glare-free light. Heat rays screened out by exclusive new Chem-O-Filter Compound "XO." Also in natural blonde and marbled yellow. Colorful. Colorfast. Virtually indestructible.



CHEM-O-GLAS (pronounced Kem-O-Glass) is precision molded in 8' lengths, 32⅞" wide, (32" wide from c/c of outside ribs when overlapped.) Some jobber-dealer territories still open.

CHEM-O-GLAS UPS SALES – Outdoor showroom of J. A. Eisele Sales, Inc., one of west coast's largest Lincoln-Mercury dealers, showing utilization of CHEM-O-GLAS ribbed structural panels as roofing for structural steel carports.

Hundreds of Uses

No need to paint - or repaint - ever!
"Your first cost is your last cost"

Everlasting . . . Everlovely . . .

CHEM-O-GLAS is available in flat sheets or the distinctive new **RIBBED** design. Many architects and builders have found ribbed **CHEM-O-GLAS** the answer to inside and outside structural and decorative problems where canvas, porcelain, tile, wood, plastic, glass, aluminum or plywood have proved impractical. Inquiries invited.

CUSTOM MOLDING: Manufacturers are invited to submit production problems to us for estimate.

Write for information today

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CITY_____

WASHINGTON LETTER —

definite and well-defined requirement standards. Our object is to set up standards for all houses.

"When this business reached a point where exceptionally large numbers of plans and outlines and suggested systems for installation came in, it became apparent that I could not undertake to review each submission, as I have no staff to aid me in this work. It is for this reason that we had to issue something and that we set the standards as broadly as possible.

"It is well to bear in mind that a set of clearly formulated standards will enable residential air conditioning to go forward with assurance."

Scope of Bulletin Outlined

Here is the text, in part, of Bulletin ME-10:

"Subject to good workmanship of installation and the conditions of acceptance . . . the equipment described in this bulletin may be considered acceptable in the construction of properties otherwise eligible for mortgage insurance under the minimum property requirements of the FHA. This acceptance applies only to installations herein described and is not to be construed as indicating acceptance of the property as a whole.

"The minimum requirements contained herein are hereby a part of the minimum construction requirements of all FHA insuring offices.

"Note: The following requirements shall be applicable when cooling equipment of the types covered is specified. They shall be made effective immediately except for cases in the following categories:

"1) The cases which previously have had a basis for acceptance established by underwriting headquarters. These may be accepted as previously indicated until further notice.

"2) Those cases submitted within approximately 90 days from this date (July 9) which, in the opinion of the chief underwriter, meet the objective of the requirements, and include information substantially in conformance with requirements of Bulletin ME-10.

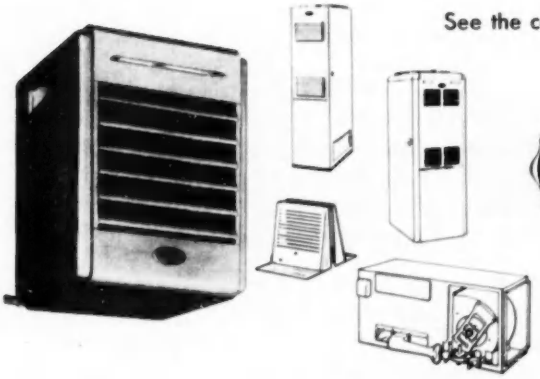
"Cooling requirements: *Objective*: The objective of requirements relating to cooling is to increase comfort in warm seasons by means of facilities which are safe, quiet, economical in operation, and will provide uniform temperature and relative humidity in the living spaces as specified when the outside dry and wet bulb temperatures are as specified; all of which are appropriate for the dwelling under consideration. *Application*: The following requirements are chiefly applicable to equipment designed for permanent installation which provides for the cooling or conditioning of spaces in dwellings by means of forced air. Other means of cooling may be accepted subject to conditions considered warranted by the chief underwriter. *Acceptable installations*: These include, in general, ductwork serving, as a minimum, the living room and any adjacent spaces not separated by doors and at least one other habitable room. Capacity of equipment, as a minimum, shall be sufficient to cool and condition the air in the living room and adjacent spaces to an extent considered acceptable

a new high in heat efficiency

UTILITY'S MODEL 50 UF UNIT HEATERS

Here is the perfect answer to problem situations where high heating power is demanded, but where the heating unit must be both compact and attractive. Only 23 inches high, Utility's Model 50 UF Unit Heater can be fitted into the smallest areas...yet it delivers 50,000 BTU.

Its low 24-voltage control makes quick and economical installations possible by eliminating the necessity for line voltage thermostat leads. Ceramic coated heat exchanger, built-in fully automatic fan control; and summer switch provides air circulation for warm weather ventilation. Designed to become an attractive addition to any store or office, Utility's Model 50 UF Unit Heater is the perfect choice for efficiency, ease of installation, low cost, and freedom from service problems. AGA-approved.



See the complete UTILITY heating line now

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4851 S. Alameda St., Los Angeles 58, Calif.

MANUFACTURERS OF GAFFERS & SATTLER AND OCCIDENTAL AUTOMATIC GAS RANGES • UTILITY AUTOMATIC GAS HEATING EQUIPMENT • UTILITY AUTOMATIC GAS WATER HEATERS • UTILITY AIR COOLERS AND BLOWERS

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Please send me free information on:

- ☐ Utility Automatic Heating Equipment
- ☐ Utility Cooling Equipment
- ☐ Utility Automatic Gas Water Heaters

Name_____

Address_____

City_____ Zone____ State_____

WASHINGTON LETTER —

by the chief underwriter. *Unacceptable installations*: These include units placed in windows or wholly within the area of a habitable room."

Data Must Be Supplied to FHA

The information that must be provided with the application for a FHA Title I loan includes:

"*Plans and specifications*: Complete specifications and plans of the proposed system, indicating estimated heat loss, heat gain, and cfm required for each conditioned space, shall be included with the submission.

Estimated Cost: The submission shall include estimated total cost of installation, annual operating cost, and maintenance cost.

"*Design conditions*: Outside and inside design conditions shall be definitely specified. Outside design conditions shall prescribe the dry bulb and wet bulb temperature. Inside conditions shall prescribe the dry bulb temperature and relative humidity. Inside conditions in excess of 80 F and 50 per cent relative humidity are not recommended.

"*Sound and vibration*: Suitable and durable means shall be provided to prevent transmission of objectionable noise or vibration generated by the equipment. The noise level in the living spaces due to the operation of the system shall not exceed 45 decibels.

"*Insulation and vapor barrier*: The cooling equipment and, where necessary, the plenum, ductwork or piping shall be so insulated and covered with a continuous, durable vapor barrier as to prevent condensation in the insulation or on exposed surfaces. In all cases, adequate means shall be taken to prevent condensation in or entrance of moisture into ductwork.

"*Supply outlets*: These shall be of acceptable size, construction and manufacture; and shall be provided with suitable and adjustable means of diffusing the air, balancing devices for volume control, and readily accessible shutoffs. Size, type, and location of registers shall be such as to provide suitable throw and diffusion of the air without direct impingement upon building surfaces, furnishings or occupants. Outlet velocities in excess of 500 fpm through free areas of registers should be avoided. High outlets are preferable for cooling. Low outlets in or near exterior walls are preferable for heating.

"*Return outlets*: Grilles or openings for return air shall be of acceptable construction and manufacture, sized to avoid velocities in excess of 500 fpm through free areas, and so located that return air from a room will not pass across normally occupied floor areas of another room in such manner as to subject occupants to perceptible drafts.

"*Piping*: When used to convey cooling water, it shall be hot-dipped galvanized, copper, or other corrosion-resistant material acceptable to the chief underwriter. Where

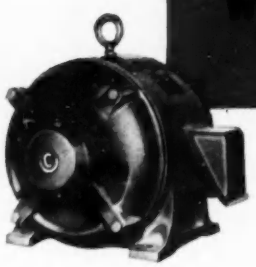
(*Please turn to page* 132)

Two Century motors installed on an air conditioning and heating system serving a 10-story office building.

THE QUIET POWER OF Century MOTORS

WILL HELP KEEP YOUR CUSTOMERS HAPPY

-792



To assure quiet starting and efficient, dependable operation manufacturers do two things. They engineer their equipment skillfully *and* they choose motors carefully to bring out the best performance in their equipment.

Many leading manufacturers of heating, ventilating and air conditioning equipment depend on Century motors. They have found that Century's wide range of motor sizes and types helps them select motors that are exactly right for every job.

Century motor-power on the equipment you install is your first step toward complete customer satisfaction. Remember, Century's nationwide network of Branch Offices and Authorized Distributors is always at your service to help you with your motor problems.

400 TO 1/8 HORSEPOWER

Century C MOTORS

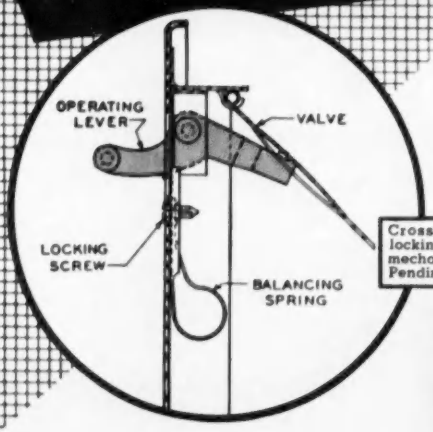
CENTURY ELECTRIC COMPANY

1806 Pine Street, St. Louis 3, Missouri

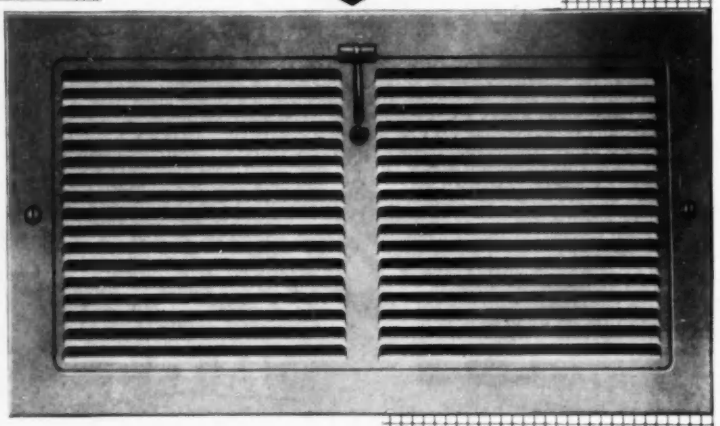
Offices and Stock Points in Principal Cities

Auer AIR CONDITIONING REGISTERS...

with easy, accurate adjustable limit-lock



Cross-section of locking-balancing mechanism (Patent Pending)



Auer now offers a dependable locking volume control device for the single-valve forced-air and air conditioning registers. With this balancing device, the proper setting is easily and quickly made by one man. The adjustment is so simple and so securely set that it can be depended upon to maintain accurate predetermined CFM requirements.

Making the original adjustment or changing the setting can be done without marring the finish of the register face. A screw driver is the only tool needed. A slight turn of the locking screw on the front of the register releases the tension on a spring in the back. Valve can then be balanced at the desired point by the operating lever. Spring positively secures this position when locking screw is tightened. After adjustment is made, the valve can still be entirely closed, but can be reopened only to the proper balancing point.

This precision adjustment device means that the Auer line of registers is now better than ever for modern air conditioning requirements—at no advance in price. Registers which are provided with this balancing mechanism as standard equipment include sizes 10 x 6, 12 x 6 and 14 x 6, in wall or baseboard models.

For complete information on Auer Air Conditioning Registers write for Bulletin 7453.

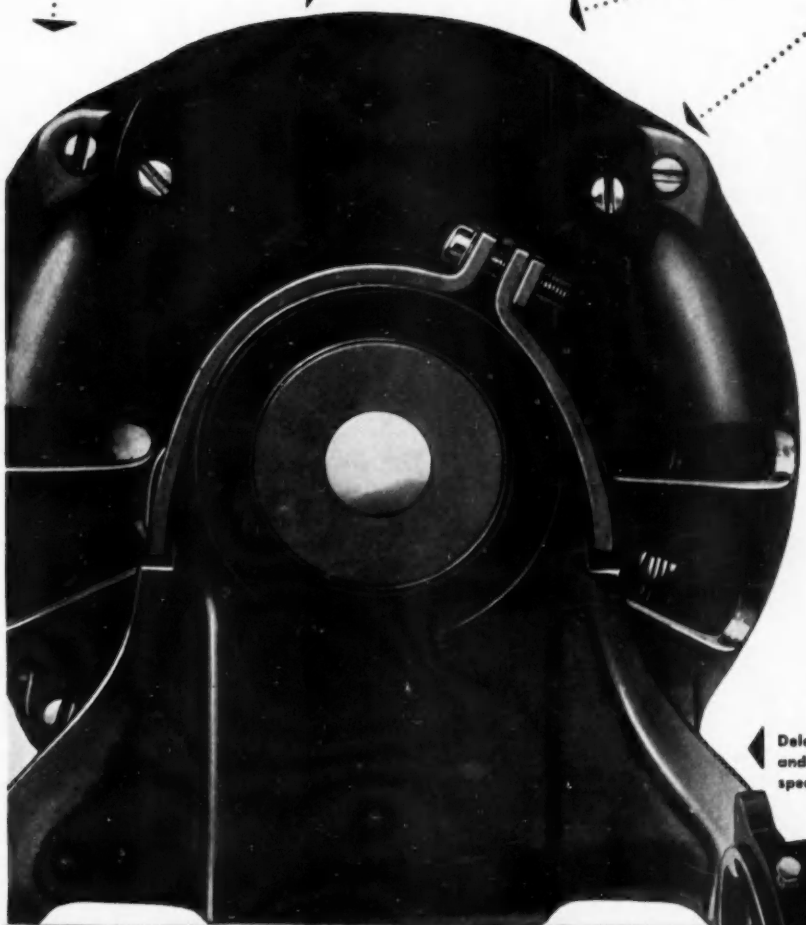
Auer REGISTERS and GRILLES

THE AUER REGISTER CO. 6600 CLEMENT AVE. • CLEVELAND 5, OHIO

Canadian Distributor—Marchand Furnace Ltd., Tilbury, Ont.

Engineered for ENDURANCE

Delco Motors



The unsurpassed record for long, dependable service that has been established by Delco motors is recognized by leading manufacturers of heating and ventilating equipment everywhere. Because Delco motors deliver continuous trouble-free service far longer than ordinary motors, more and more manufacturers demand Delco when dependability is a must.

Critical selection of materials and careful dynamic balance—plus special features such as uniflow pressure-cast rotor conductors, steel backed babbitt sleeve bearings, cored oil wells, varnish-dipped and baked motor windings—make Delco motors the right motors for your product.

You will find the motors you need, in sizes from fractional to 100 h. p., in the great Delco line. For information on motors for any application, address Delco Products, Dayton 24, Ohio, or our nearest sales office.

MOTORS FOR BLOWERS

Delco resilient-mounted motors, split-phase and capacitor-start types, single- and two-speed designs—1/6- to 3/4-h.p. ratings.

MOTORS FOR OIL BURNERS

Delco flange-mounted motors, split-phase 1/6- to 1/4-h.p. ratings.

THE BEST RUNNING MATE YOUR PRODUCT CAN HAVE

DELCO DAYTON OHIO

DELCO PRODUCTS

Division of General Motors Corporation • Dayton, Ohio

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Jackpot WITH Luxaire!

NOW! More Complete than Ever with a Furnace for ANY Order!

When you sell Luxaire your are selling the most up-to-date — most complete line of heating and year 'round air conditioning equipment ever offered to the heating trade.

When you sell Luxaire you can't help but hit the "Jackpot" everytime because with Luxaire you have the right unit for any type of heating installation — and for any fuel.

You hit the jackpot consistently, too, because most Luxaire furnaces are approved for either gas or oil firing. With Luxaire you install the furnace now and add either the gas or oil burner anytime. Or — install for either fuel now and convert to the other — anytime — at a surprisingly low cost.

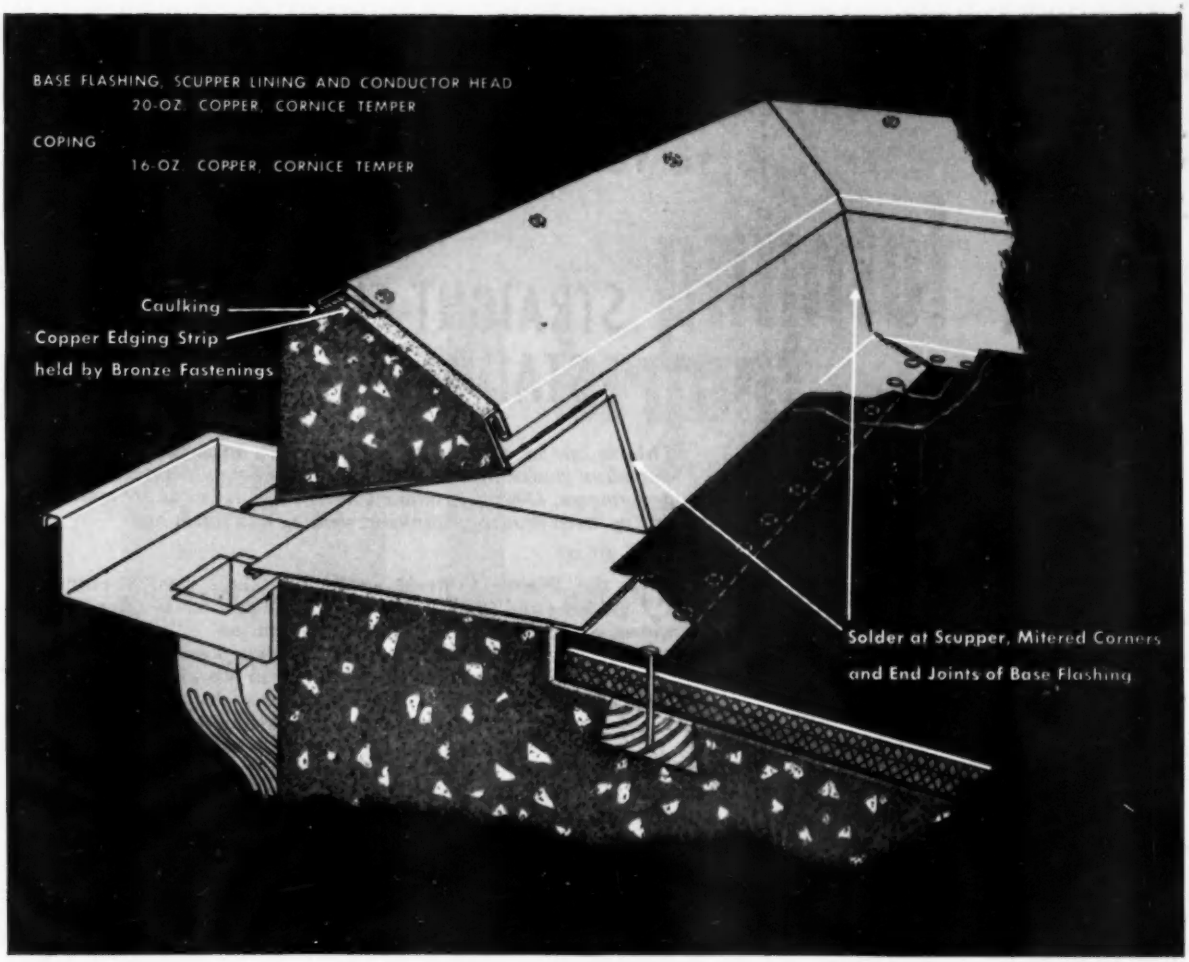
So with Luxaire you have a tremendous, unlimited sales potential! You can fill any order profitably!

See your Luxaire jobber NOW! Don't delay. Start hitting the Jackpot the Luxaire way.

Most Furnaces Approved for Either GAS or OIL!

THE Luxaire® C. A. OLSEN MANUFACTURING COMPANY • ELYRIA, OHIO

HEATING & AIR CONDITIONING UNITS



Flashing design for parapet with roof scupper

On buildings where the parapet is designed as little more than a curb and in climates where snowfall is not severe, scuppers leading to outside downspouts offer an economical method of providing for roof drainage.

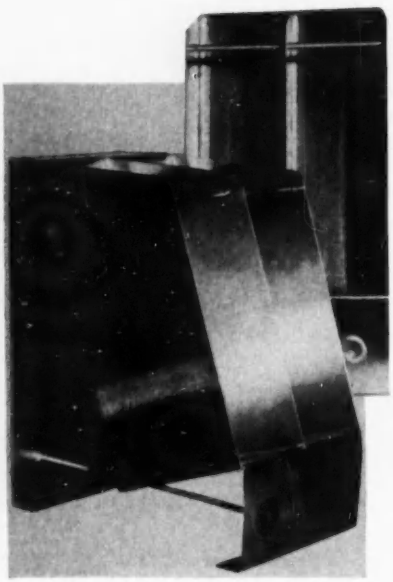
This drawing shows the details of a base flashing and scupper lining secured to the roof deck. A 16-oz. copper coping, joined to the 20-oz. base flashing with a loose clinch lock, protects the vertical mortar joints of the masonry. Free-sliding, weathertight expansion joints should be installed on the copper coping at 24-ft. intervals and wherever expansion is provided for in the structure.

SOME ANSWERS

TO YOUR SHOP QUESTIONS

ON forming STRAIGHT-CHROMIUM STAINLESS STEELS

This is one of a series of advertisements discussing the straight-chromium grades of Stainless Steel from the standpoint of fabricating performance. Other operations that will be considered are machining, cutting, deep drawing, spinning, welding and finishing.



Formed from U·S·S 17 (Type 430) Stainless Steel

These utensil racks were fabricated from 16 gage sheets and ⅝" rods of U·S·S 17 (Type 430) Stainless Steel by Purity Manufacturing Company, Cattaraugus, N. Y. Forming was done on a press brake and bends exceeding 90° were accomplished without difficulty. Other fabricating operations included argon and spot welding and grinding.

Purity Manufacturing turned to straight-chromium fabrication more than a year ago, after years of specialization on dairy industry equipment of nickel-bearing Stainless Steel. They have encountered no difficulty in fabrication.

OF the Stainless Steels available today, straight-chromium grades—and especially U·S·S 17 (Type 430)—offer you the widest possibilities in fabrication and end use.

Press and brake forming of sheet and strip are among the most common shop operations encountered in working these grades. Here are a few facts to keep in mind for such operations in order to get the maximum performance from straight-chromium grades.

Type 430 Stainless Steel has a lower tensile strength than the nickel-bearing grades. This permits it to be formed on tools that have less power available than those used for nickel-bearing grades. Forming tools rated at a definite capacity for carbon steels are suitable for straight-chromium Stainless Steels of approximately the same thickness.

Although additional steps or operations may be required, fabricators who have worked with straight-chromium grades generally report that almost anything that can be made from nickel-bearing Stainless Steel can also be formed from straight-chromium grades.

In planning and layout, take into consideration the fact that Type 430 possesses directional properties. As a result, it is sensitive to longitudinal breaking in the course of lock seaming and bending. Additional steps or operations will offset this tendency.

In every case it will pay you to consult with our representatives concerning these grades. They will examine the job from the standpoints of both end use and shop equipment and give you their recommendations.

WRITE FOR OUR FREE BOOK

You'll find the full story on working characteristics of the straight-chromium grades of U·S·S Stainless Steel, as well as nickel-bearing grades, in our book "Fabrication of U·S·S Stainless and Heat Resisting Steels." For your copy, write to United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S STAINLESS STEEL

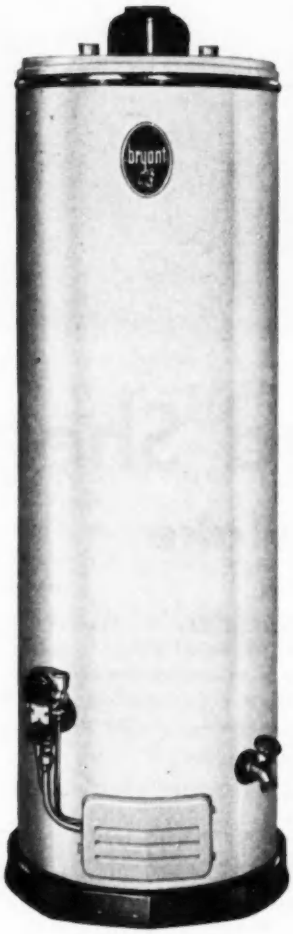
USS

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

3-43

UNITED STATES STEEL

its product prestige means... PLUS PROFITS FOR YOU!



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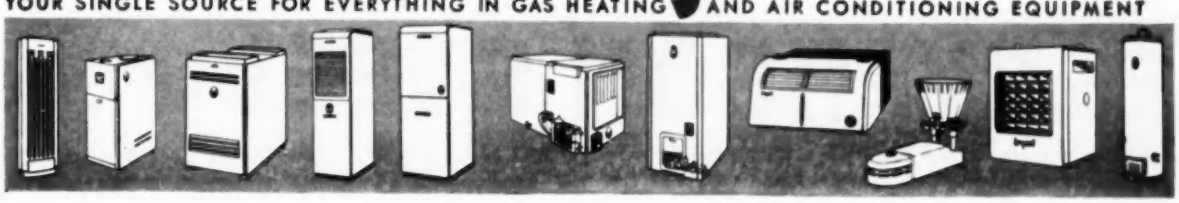

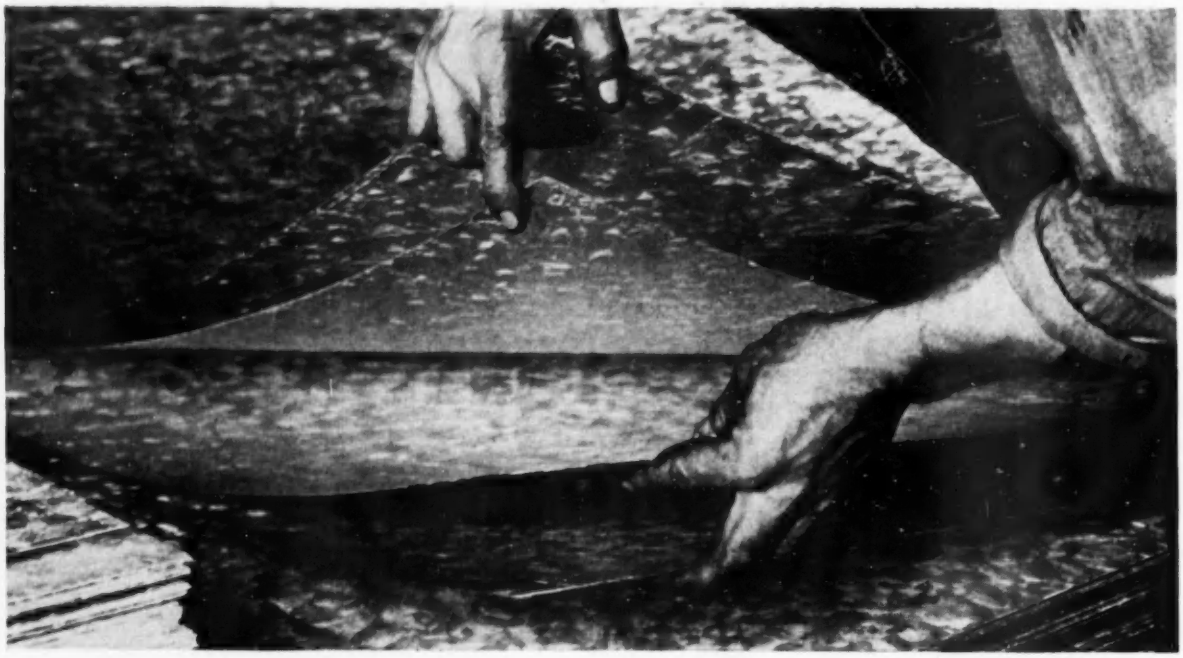

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AMERICAN ARTISAN

An Open Letter to a Misguided Newspaper Editor

[An editorial in a small newspaper condemned in unreasonable and inaccurate language the choice of warm air heating for the community's schools. Here's an answer to the misguided editor. For further comments, see page 76.]

DEAR EDITOR:

After reading the recent editorial about heating that appeared in your newspaper, I feel that you must have been deceived by someone with some sort of an axe to grind and been led to present, as facts, statements taken in part from an old government bulletin on a somewhat different subject.

The statements made in your editorial imply that a forced warm air heating system is not the most desirable heating system for the new schools that are being planned for your community. I realize that you are not a heating man and that you are not in a position to decide what is true and what is false, and that you must put your trust in someone whom you believe to be a qualified heating man. I am puzzled as to why anyone would take the trouble to distort known facts by quoting only part of a government report on ventilation and omitting the qualifying statements which explain in detail the complete findings of those who made the original report.

Your editorial shows clearly that you do not understand this method of heating. For example, in describing the way a forced warm air system operates, you state that the air is returned to "the boiler room." At another point you refer to the forced warm air system as a "hot air" system. The editorial is filled with similar errors that could only be committed by a person unfamiliar with heating.

The only difference between a forced warm air system and any other heating system is the means by which the air is heated. In the warm air system the air is passed directly over the heat exchanger, whereas in any other type of heating system a secondary method of heating the air must be used. When such a secondary method is used, the initial and operating costs are far greater than when the direct fired furnace system is used because of the extra equipment required to move the heating medium to and from its heat source and the increasing inefficiencies due to the greater heat losses that occur throughout both the secondary and the primary heating systems.

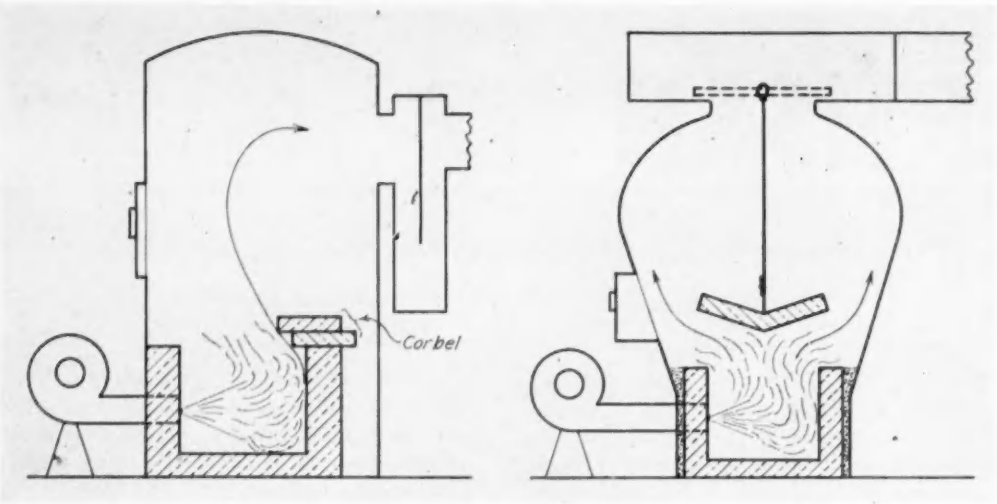
If it is your desire to save your fellow citizens money on the cost of installing and operating the heating systems for the schools of your community, then we suggest that you look more completely into the published data that is the result of years of testing at the University of Illinois under the sponsorship of the National Warm Air Heating and Air Conditioning Association. Other experimental data is available from the University of Minnesota, the University of Michigan, and many other leading universities.

To learn how well forced warm air heating systems are working, you might consider the fact that in 1952 alone, over 80 per cent of the one family homes built were heated with forced warm air systems. If you still doubt the satisfaction that can be obtained for public school applications, why not write some of the thousands of schools and other public buildings in which forced warm air systems have been installed and are performing very satisfactorily.

Looking further into the heating of modern schools, it will be found that all are—strictly speaking—heated with forced warm air regardless of what type of system is used. Only by using mechanical means of introducing fresh air and distributing the air within the building or within individual rooms can proper heating and ventilating systems be installed, since the condition of the air within the classroom depends upon the amount of fresh air which is introduced together with the proper filtration, humidification and circulation required for comfort and health. As long as sufficient fresh air is introduced and stale air exhausted, the air within the room will not be a "source of disease breeding" as stated in your editorial. This principle is recognized in the heating and ventilating of office buildings, theaters, churches and the like, and the American Society of Heating and Ventilating Engineers has set up minimum fresh air requirements for most of these buildings. Local government codes usually follow the recommendations of this society in setting up their own local code requirements.

There are literally billions of cubic feet of air being circulated every day throughout the country. The fact that the air is removed from the room and returned does not make it any worse than if the air had been left in the room.

In closing, I would like to suggest that the next time you feel the urge to write an editorial about heating, you might avail yourself of the information which the American Artisan, the National Warm Air Heating and Air Conditioning Association, or other industry leaders will be glad to furnish.



1 AS A SOLUTION to a problem described, a combustion chamber was built with a corbel on the back wall. A 2 to 3 in. overlap usually is sufficient, depending on the diameter of the combustion chamber

2 ONE WAY to improve the efficiency of a furnace with an opening at top center is to install a hanging baffle plate 12 to 16 in. above the combustion chamber

Improving the Efficiency of Oil Fired Equipment

By Eugene O. Olson
Chief Engineer, Delavan Mfg. Co.

As an aid in "trouble shooting," this article explains the major causes of inefficient operation — excess air, high stack temperature, and smoke—and outlines a variety of methods—such as plugging leaks, using furnace baffles, and adjusting burners — for solving servicing problems

MOST WARM AIR heating dealers do a large volume of servicing work, which often involves oil burners and oil fired equipment. What are some typical problems which must be tackled and solved in this type of work?

Often, the service man must correct a situation in which heat is being wasted. Many tools and techniques are at his disposal for diagnosing the causes of such waste and for correcting the situation. To illustrate these techniques, let's look at how Joe Adams, a service man for a typical warm air heating dealer, solved a specific problem.

Joe's company, the Larson Heating Co., received a call from a new home owner who said that, though he was satisfied with the amount of heat he was getting, his first fuel bill seemed unreasonably high. Joe was sent over to investigate.

He found that the system was a conversion warm air job; an oil burner had been installed in a coal furnace. The furnace was steel, with a crescent type radiator, and was in good condition. The oil burner was a well known brand, one which Joe knew should give reasonably good economy as well as trouble-free service.

Joe started the burner and looked inside the 26 in. furnace. The combustion chamber consisted of two

rows of hard fire brick on end, one row on top of the other, laid flat against the sides of the furnace all around. Some of them had fallen down. There was no floor except the bottom of the furnace. The fire was a sharp white in color, and there was no soot in the furnace. The owner said that he was "burning lots of air" and therefore "should have economical heating." Joe also noticed that the basement floor was very warm about 2 ft away from the furnace.

Joe or any service man might know of several things to do on this job without using instruments. However, Joe wanted all the facts. So he took readings with his draft gage, flue gas analyser, and stack thermometer. Here are his first readings:

Draft over the fire ..... 0.05 in.
Draft at the stack ..... 0.12 in.
CO_2 ..... 5 per cent
Stack temperature..... 750 F
Appearance of fire ..... very bright

Some Terms Defined

Let's leave Joe Adams for a bit and see what these figures mean. Stack temperature is the temperature of the flue gases leaving the furnace. It is the measure of heat being lost or, in other words, not being absorbed by the heating system. A high stack temperature may indicate overfiring — a fuel input or nozzle capacity too high for the furnace. It may also indicate that the furnace is too small and must be overfired to deliver sufficient heat to the living area. It may indicate inefficient furnace design or sooted-up flues. It can also be related to burner design and burner adjustment. A stack temperature of 400 to 600 F measured just at the exit from the furnace is considered normal.

CO_2 is connected with combustion, which in our terms is rapid oxidation of fuel. That means that the elements of which oil is composed — carbon and hydrogen — unite with oxygen from the air, and the process gives off heat. In simple chemical terms we may write C (carbon) plus O_2 (oxygen) gives CO_2 (carbon dioxide). If we burned pure carbon in pure oxygen, we would have 100 per cent CO_2 as our flue gas. But air is only 21 per cent oxygen. So, with pure carbon and air, we would get approximately 21 per cent CO_2 by volume. The other 79 per cent of the air is nitrogen, which does nothing except carry heat up the stack. This is part of the "unavoidable" stack loss.

The proportions of carbon and hydrogen in No. 2 fuel oil are such that the maximum CO_2 possible with oil and air is approximately 15.4 per cent. The rest of the oxygen in the air is used to burn the hydrogen forming H_2O which appears in the flue gas in the form of vapor. The latent heat of this vapor is also an unavoidable loss. This 15.4 per cent CO_2 is a theoretical figure and is rarely ever attained in practice, but it is the goal toward which the designers of oil burners work. The efficiency of the burner is measured by how near this theoretical maximum it will operate without smoke. The resultant CO_2 is less than the theoretical 15.4 per cent because it is diluted with excess air. Since it is difficult to make a perfect machine, it is necessary to provide a factor of safety by supplying excess air through the burner to avoid trouble. The more efficient the burner design, the less excess air will be needed to insure clean burning. 10 to 12 per cent CO_2 is considered efficient operation. Less efficient burners will require more excess air to burn clean and usually are set at something less than 10 per cent CO_2.

Must Reduce Excess Air

Excess air may not always get into the furnace through the burner fan. It may get in through openings such as those caused by ill-fitting doors and through cracks in the furnace itself. In any case the excess air is of no use in the combustion process, but enters the furnace at room temperature and leaves at the stack temperature, carrying away that much heat. *Anything that can be done to reduce the excess air will increase the efficiency of the heating plant.*

Let's take a look at draft before we go back to Joe's job. Draft as we speak of it here is not air. Draft as we use the term in connection with combustion is the difference in pressure between the outside and the inside of the chimney and the furnace connected to it. The column of hot gases inside the chimney is lighter than the equivalent column of air outside the chimney. That difference in pressure is transmitted to the furnace and air will flow into the furnace through any opening because the pressure is less on the inside. The difference is not great and is measured not in pounds per square inch but in hundredths of an inch of water column. A normal draft setting measured at the front of the furnace with a draft gage is 0.02 to 0.04 in. That is just enough

Table 1—Approximate Per Cent of Stack Heat Loss Occurring at Various CO_2 Readings and Stack Temperatures. (A generally accepted standard heat loss figure is 20 per cent)

Stack Temp.	Per Cent of CO_2 in Flue Gas											
F	4	5	6	7	8	9	10	11	12	13	14	15
300	21.5	19.5	17.5	15.5	14.5	14.0	13.0	12.5	12.0	11.0	11.0	10.0
350	25.5	23.0	20.5	18.5	17.0	15.5	15.0	14.0	13.5	13.0	12.5	12.0
400	29.5	27.0	24.5	21.0	19.0	18.5	17.0	16.0	15.5	15.0	14.5	14.0
425	31.0	28.5	25.0	22.5	20.5	19.0	18.0	16.5	15.5	15.0	14.5	14.0
450	33.0	30.0	27.0	24.5	22.5	20.5	19.0	18.0	16.5	15.5	15.0	15.0
475	35.5	32.0	27.5	25.0	23.0	21.0	19.5	18.5	17.0	16.5	15.5	15.5
500	38.0	34.0	30.0	26.5	24.5	22.5	20.5	19.5	18.5	17.0	18.0	16.5
525	39.5	35.5	31.5	27.5	26.0	23.5	22.0	20.5	19.0	18.5	18.0	17.0
550	41.0	37.0	33.0	29.0	26.5	25.0	23.0	21.0	20.5	19.0	18.5	18.0
575	42.5	38.0	34.0	30.5	27.5	26.0	25.5	22.0	21.0	19.5	19.0	18.5
600	44.0	39.5	36.0	32.0	29.0	27.0	25.0	25.0	22.0	20.5	19.5	19.0
650	48.0	44.0	38.5	34.5	31.5	28.5	26.5	25.0	23.0	22.0	21.0	20.5
700	51.0	47.5	42.0	37.0	34.0	31.5	28.5	27.0	26.0	23.5	22.5	22.0
750	56.0	51.5	46.5	41.0	36.5	32.5	30.5	28.5	27.0	26.0	24.5	23.0
800	61.0	55.0	48.5	43.0	38.0	35.5	32.5	30.5	28.5	27.0	26.0	24.5

to be sure that the products of combustion will be carried up the chimney.

A draft gage can be used to discover other things about the heating plant as well. For example, if the draft measured at the front of the furnace is much lower than that measured in the smoke pipe, it would indicate an obstruction in the furnace passages or a large air leak in the furnace, or it might even indicate overfiring or too much excess air through the burner.

Joe Finds the Cause

Now where did we leave Joe? What would you do with those numbers? Joe dug out his stack loss table (see Table 1) and on it he found that with a CO_2 reading of 5 per cent and a stack temperature of 750 F he had a stack loss of 51.5 per cent. There was no loss in smoke because there wasn't any smoke. He explained to the owner that more than 50 per cent of his fuel was going up the chimney, not as oil or as soot but mostly as heat carried away by excess air. He showed that regardless of how much air was supplied by the burner one gallon of oil could only use the oxygen from approximately 1325 cu ft. Any air over that is excess.

Then he outlined his procedure for correcting the situation:

1. He would install the proper size nozzle in the burner. He would take out the 2.50 gph nozzle that was in the burner and install approximately a 1.65 gph of the proper type and spray angle for the burner.
2. He would build the correct combustion chamber for the burner with the new nozzle.
3. He would install a draft regulator and adjust it as it should be adjusted.
4. He would clean up the burner and adjust it as it should be adjusted.
5. He would seal all air leaks around the doors, where the water coil used to be, and any other places where he found leaks with his candle.

How the Job Was Done

The owner thought it looked like an expensive project and asked how much he would save. Joe explained that he thought he could reduce the fuel loss from 51.5 to about 20 per cent, which is considered efficient operation for a conversion job. He got the job.

For the 1.65 gph, 80 deg nozzle, Joe built a combustion chamber of insulating brick 12 in. x 13 in. x 16 in. high, with a 2½ in. corbel on the back wall above the 16 in. level. (See Fig. 1). He laid a floor of 2 in. insulating brick. The space behind the brick he filled with insulating material.

He discovered that the "direct draft damper" which short-circuited the radiator for hand firing of coal was warped and did not form a tight seal between the stack and furnace. So he cemented it shut permanently and removed the handle.

After making all the changes he had proposed, Joe took another reading. It looked like this:

Draft over the fire	0.03 in.
Draft in the stack	0.05 in.
CO_2	11.5 per cent
Stack temperature	525 F
Appearance of fire	normal
Stack loss from chart	approximately 20 per cent

Joe had made a tremendous reduction in the amount of fuel wasted, and he had not used any magic or mysterious formula to do

Table 2—How to Correct Conditions Causing Excess Air in Flue Gases

Cause	Cure
1. Air leaks in the furnace.	Plug the leaks if possible. If not, get a new furnace.
2. Inefficient oil burner.	a) Get a new, more efficient burner. b) Build a combustion chamber that will help the burner do a good job.
3. Combustion chamber not properly designed.	Build a proper size and shape of chamber.
4. Improper nozzle or improper adjustment of the oil burner.	a) Match the nozzle spray angle and pattern to the air pattern. b) Adjust the oil burner properly. The pressure on the fuel pump should be set at 100 psi or higher, and the air to the burner should be adjusted so that just enough air is supplied to prevent smoking.
5. Partially plugged nozzle, indicated by smoky, off-center fire.	a) Clean the nozzle or put in a new nozzle. b) Install a good line filter to protect the burner and the nozzle.
6. Chimney draft too strong.	Install a good draft regulator and adjust to 0.02 to 0.04 in. over the fire.
7. Burner in need of repair.	Remove the burner and check for condition of fan, motor, pump, electrodes and combustion head. Repair if necessary.

Table 3—Causes of Excessive Stack Temperature and Corrective Measures

Cause	Cure
1. Furnace too small for the job.	Size the heating unit properly for the load.
2. Furnace not designed for high efficiency with oil.	Baffles of various types can be used (see Fig. 2).
3. Nozzle too large in capacity for the furnace.	Choose proper nozzle size for the furnace, not for the job.
4. Sooted-up heating surfaces.	Adjust the burner to eliminate smoke. Then clean out the soot.
5. Too much excess air through the burner (this increases the stack temperature, does not decrease it as might be expected).	Adjust the burner for correct air setting.

Table 4—Various Methods for Eliminating Conditions Causing Smoke

Cause	Cure
1. Fan blades loaded with dirt, lint, and oil.	Clean the fan so that it can supply sufficient air for combustion.
2. A partially plugged nozzle.	Clean the nozzle and the nozzle strainer or put on a new nozzle. It may also be necessary to clean the line filter and the pump strainer.
3. Nozzle too large for the burner or the combustion chamber.	Install the proper size nozzle to obtain the best conditions possible within the existing combustion chamber.
4. Oil pressure too low for good atomization.	If the pump pressure is set below 100 psi, droplet size will be too large for good, clean combustion, and smoke may result. In larger nozzles, pressures under 100 psi may be permissible, but in small sizes, such as are used in domestic jobs, pressure should always be 100 psi or higher.
5. Poor quality oil.	If the viscosity of the oil is high, the spray from small size nozzles will be coarse and it may be difficult to clean up the smoke by increasing the air supply. In this case, the fire usually gets very noisy and there may even be pulsation. Solutions: a) If good oil is available, change to this. If the nozzle size is 0.75 gph or less, it may be advisable to try No. 1 oil. b) High viscosity oil can be handled satisfactorily in many cases by increasing the pump pressure to supply extra energy to overcome the effect of the viscosity. Increasing the pump pressure to 125 psi will in many cases give a stable fire and eliminate the smoke and noise.

it. He had simply installed the equipment correctly and adjusted it correctly. He had reduced the excess air and the temperature of that excess air as it left the furnace.

Before leaving the job Joe did one more thing. He made a quick calculation of the heat loss of the house just to make sure that the 1.65 gph fire would handle it in cold weather. He found he had ample fuel input, and so left the job that way.

Heat Loss — Causes and Cures

Now let's look at the sources of heat loss in more detail and suggest causes and cures.

Excess air, as we have pointed out, is the largest cause of fuel loss or inefficiency in an oil burner or any fuel burning device. The loss of fuel due to other causes is usually small in comparison. A variety of factors causes this condition, and there are numerous ways in which it can be corrected (see Table 2).

Stack temperature is another factor in heat loss. Excess air is a loss only to the extent that the flue gases are heated. If the stack temperature is above 600 F, it usually is considered too high for economical operation. As a matter of fact, many engineers and designers consider 500 F the top limit for well designed equipment. Excessive stack temperature may exist for a number of reasons (see Table 3).

In rare cases, smoke can cause an appreciable loss, but it generally causes a loss because of the sooting up of the flues and the consequent increase in stack temperatures. Smoking in an oil burner has a variety of causes (see Table 4). It is good practice to take a smoke reading every time a CO_2 reading is taken. There are some convenient smoke testers available commercially and these will eliminate the guesswork as to how clean a fire is. A burner setting with slightly dark flame tips will show approximately No. 2 smoke on a common filter spot test. This will not usually build soot in the furnace.

We have mentioned several items of equipment, and we should look at these in more detail from both the selection and servicing points of view. This will be done in the next article, which will give further instructions on some of the cures (furnace baffling, nozzle adjustment, etc.) which have been listed.

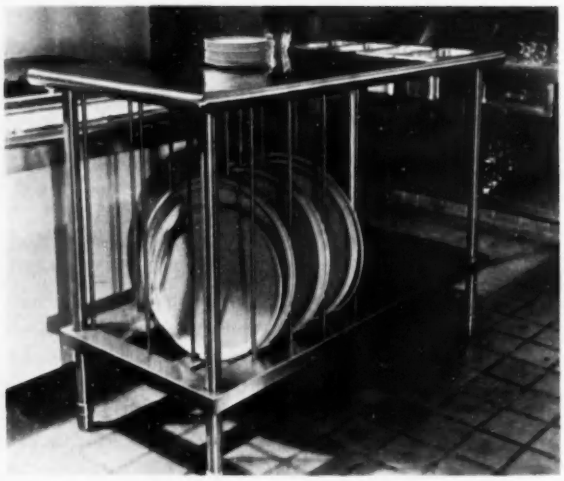
[Table 1 is courtesy F. W. Dwyer Mfg. Co.]

MARKETING DATA FOR HEATING DEALERS

INFORMATION WHICH can help warm air heating dealers and sheet metal contractors to direct their selling efforts is given on pages 74 and 75. Data for areas other than those listed this month has been published in earlier issues of American Artisan and can be found as follows:

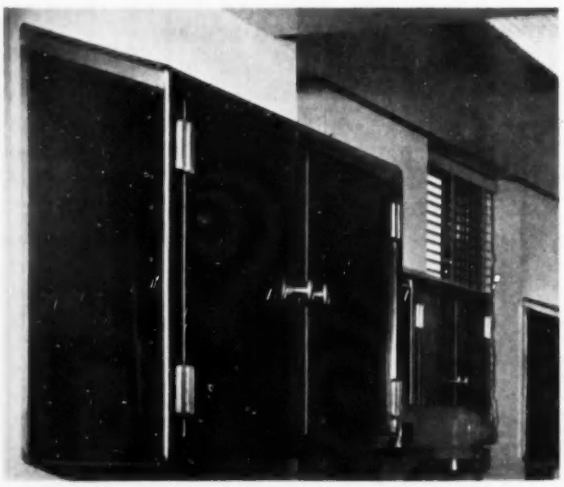
City	*Month*	*Page*	*City*	*Month*	*Page*
Birmingham	August	70	Minneapolis	July	79
Bridgeport	May	81	Reading	June	73
Dallas	July	79	Rockford	June	73
Des Moines	August	71	Sacramento	August	70
Detroit	August	71	Saint Paul	July	79
Evansville	May	81	Savannah	July	78
Fall River	June	73	Seattle	June	73
Fort Wayne	May	81	Syracuse	July	79
Fort Worth	August	71	Toledo	September	78
Greensboro	May	81	Wilmington	August	71
High Point	May	81	Worcester	July	79
Los Angeles	July	78			

1 THIS LARGE KITCHEN (showing custom made hot dish counter at right, setup table at center, salad and dessert table at left) makes use of stainless steel equipment such as . . .

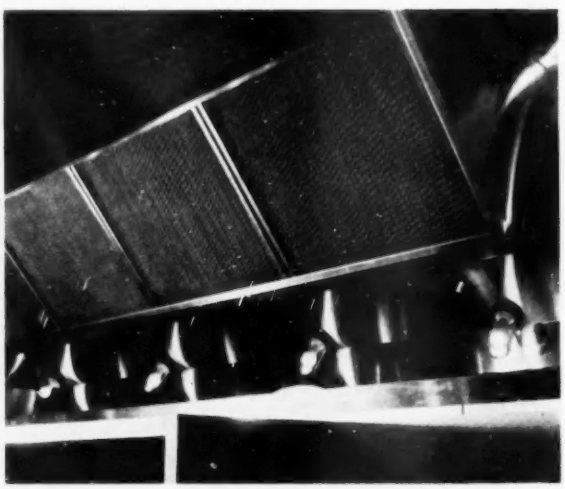


2 A TRAY RACK constructed of rods, pipe, and sheet . . .

3 A CART for storing and distributing silverware . . .



4 SPECIAL CABINETS with sloping tops for easy cleaning . . .



5 AND A 14 FT LONG stove canopy with filter framework

Stainless Steel Tailored to Fit Restaurant Kitchen

. . . The construction of custom made tables, tray racks, sinks, a stove canopy and cabinets — all fabricated from Type 430 stainless steel — is described in detail

CUSTOM MADE FIXTURES and equipment fabricated from stainless steel dominate the modern restaurant kitchens of 525 William Penn Place, a Pittsburgh office building. The 16th floor kitchen, for example, has a cook's table, setup table, stove canopy, dishwashing area, vegetable preparation area, pantry tables, cabinets, and other items all custom made of stainless steel by Southern Equipment Co., St. Louis.

In an office building such as this, there is an almost guaranteed minimum patronage, and assurance of a long period in which to amortize equipment. Therefore, maximum attention can be given to custom made equipment which may be higher in first cost, but may prove more serviceable for the specific application in the long run.

Standard equipment is also largely stainless steel. For example, the refrigerators are stainless steel both inside and out.

The main kitchen on the 16th floor serves a 165-seat dining room, and provides food for a 260-seat cafeteria on the 17th floor. A small kitchen, for an executive dining room on the 38th floor, also uses stainless steel equipment, almost entirely.

How Setup Table Was Made

One interesting custom built item is the setup table (at center, Fig. 1), which is especially designed to promote efficient flow of traffic in the 16th floor kitchen. The table and an attached stainless steel roll warmer divide a large open area into two aisles. A pantry counter is on one side, and on the other side is a cooks' table from which waitresses pick up hot dishes. Thus waitresses seeking desserts or salads do not interfere with those picking up main courses, yet both can turn to the center table to assemble on trays the items they are picking up.

The frame of the table is of 1¼ in. stainless steel pipe. At one point there is a field joint, required because the complete unit would have been too big to fit into the elevators of the building. The joint was made by welding a stainless steel collar to the center vertical legs on each side. The ends of the horizontal cross-braces fit into these, and are held by set screws. The table top is of 14 gage stainless steel sheet, braced with fabricated stainless angles. Exposed edges are bull-nose-rolled down, and the edge which butts against the roll warmer is turned up.

The lower shelf is of 14 gage stainless steel with all edges rolled down. Both top and undershelf are removable. The end against the roll warmer has a tray rack, made with four rows of three ½ in. OD stainless steel rods, welded in place.

Tray Racks of Welded Construction

Two interesting specialty items which have been designed and built for the executive dining room and kitchen are a tray rack and cart for silver trays.

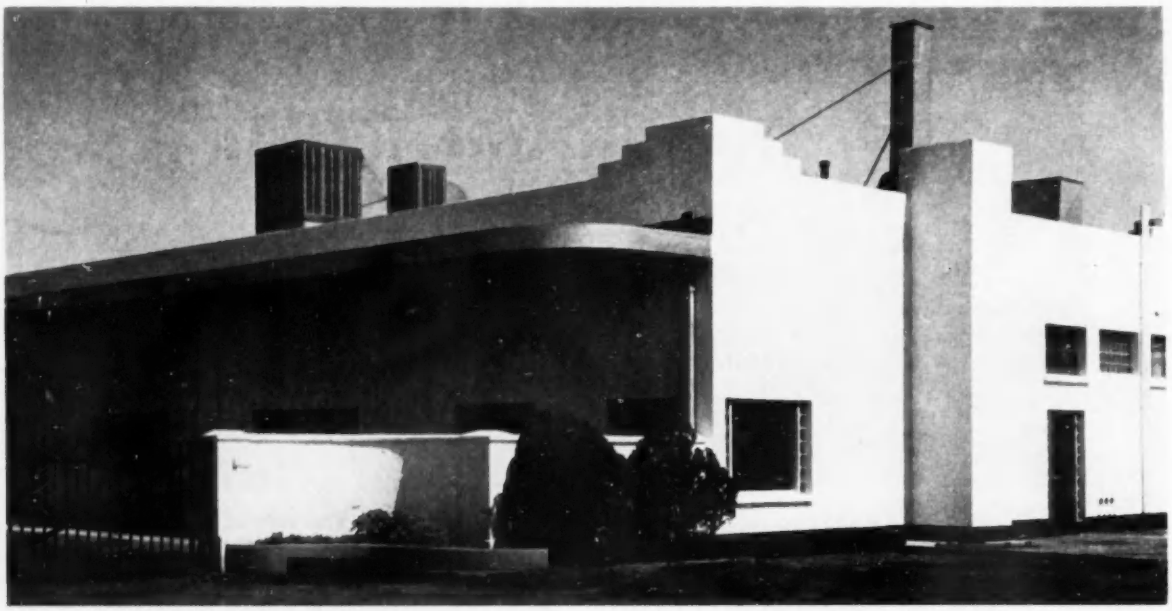
The tray rack (Fig. 2) stands 3½ ft high. It is of welded construction, with 1½ in. stainless steel legs, and 1⅝ in. OD stainless steel tubing braces. A well in the top holds four removable stainless steel pans. The tray rack section utilizes the same construction as the equivalent part of the setup table previously described. It has five rows of ½ in. stainless steel rods, three rods per row, spaced vertically on about 6 in. centers. They are welded at the top to fabricated angles welded to the table top. At the bottom, the outside rods in each row are welded to the undershelf, and the center row, to a stainless steel channel below the undershelf.

The table top is 14 gage stainless steel sheet, bull-nose-rolled down on all sides. The lower shelf, cut out to accommodate the trays, is also of 14 gage stainless, with a 1¾ in. turndown on all sides.

The second specialty item is a portable rack (Fig. 3) which holds wooden trays of dining room tableware. This has a body of 1½ x 1½ in. x 14 gage stainless fabricated steel angle iron. Supports for the trays are also made of fabricated stainless steel angles. On the bottom are 4 in. diameter casters, two of which are rigid and two of which swivel.

This unit is used to store dining room tableware at

(Please turn to page 132)



1 METHODS DESCRIBED are applicable to a wide range of applications, from small residences to larger buildings such as this bottling plant

How to Size Evaporative Coolers

. . . on the basis of four methods in current use, which take into account a wide variety of factors. Specific selection problems are worked out for each method

By Robert S. Ash
Professional Engineer

THE AREAS suitable for evaporative cooling are a much discussed question. Almost all inland areas are satisfactory for evaporative cooling provided the proper number of air changes is used. In many areas along the seacoasts, evaporative cooling has been found to provide satisfactory comfort conditions. This method of cooling is suitable for residences as well as larger structures (such as the bottling plant shown in Fig. 1).

Four methods of sizing evaporative coolers are outlined in this article. The more detailed methods should be used when possible, especially in those areas where the prevailing wet bulb temperature appreciably exceeds 75 F. Shortcut methods frequently prove inadequate.

Wet Bulb Depression Method

Some dealers size evaporative coolers by calculating the required number of air changes and relating these changes to the prevailing summer daytime relative humidity for the area in which the installation is to be made. However, if air changes are, instead, related to the wet bulb depression of an area (the number of degrees of difference between the dry bulb temperature and the wet bulb temperature), calculations will be more exact. Some relationships between air changes and wet bulb depression are shown in Table 1, which can be used as a guide to selection of evaporative coolers for specific locations.

To arrive at the correct wet bulb depression for an area, the dealer may consult the design temperature data compiled by the U. S. Weather Bureau and published in the 1953 *Heating Ventilating Air Conditioning Guide* of the American Society of Heating and Ventilating Engineers. The information appears on pages 267-270, under the title, *Table II, Summer Climatic Conditions.* This table gives the design temperatures for most areas, and once the design dry bulb and wet bulb temperatures are known, the wet bulb depression can be determined.

To illustrate the wet bulb depression method, we can select several locations, and, using Table 1 and the ASHVE table on climatic conditions, can determine the factor for estimating the volume of air to be delivered in each case.

Suppose a Bakersfield, Calif., house of 7200 cu ft capacity is to be cooled. Consulting page 267 of the 1953 ASHVE *Guide*, we find that Bakersfield has a dry bulb temperature of 105 F and a wet bulb temperature of 70 F, or a wet bulb depression of 35 F. Table 1 indicates that for a wet bulb depression temperature of 35 F, a three minute air change is recommended. Thus, 7200 cu ft of air must be moved through the cooler every three minutes, or a cooler with a 2400 cfm delivery is required. A second problem could involve the selection of a cooler for a house in Amarillo, Tex. Referring to the ASHVE *Guide*, page 270, we see that Amarillo has dry bulb and wet bulb temperatures of 100 F and 72 F, or a wet bulb depression of 28 F, which would indicate a two minute air change, according to Table 1. Thus, 7200 cu ft divided by two gives us a required cooler capacity of 3600 cfm.

Dry and wet bulb temperatures of 95 and 75 F are given for New York City or a wet bulb depression of 20 F, which would indicate a one and one-half minute air change according to Table 1. Using the same size building of 7200 cu ft and calculating the cooler capacity, we will find that a cooler rated for 4467 cfm should be selected.

Accounting for Heat Load

One of the most apparent shortcomings of a quick method of calculation is that all installations within a given area are considered to be the same. Obviously, this is not true. An insulated house requires less cooling capacity than an uninsulated one; a tailor shop with pressing machines requires more cooling capacity than an ice cream shop of equal size. A second method of calculating the cooler size takes such factors into consideration. Fig. 2 is a zone map that has been designed to show those areas having approximately the same humidity ratio conditions. The air changes recommended for use in the different zones shown in Fig. 2 are tabulated in Table 2. The following steps are used to determine the size of the cooler:

1. Consult Fig. 2 and determine in which zone the installation is to be made.
2. Determine whether an excessive or normal interior heat load will exist most of the time. The excessive heat load factor applies where many stoves, pressing machines or crowds of people are present. The normal heat load factor should be used for interiors in which no excessive heat is created.
3. Determine whether the exterior heat load is protected or exposed. Use the exposed exterior heat load factor where the roof is not protected from the heat of the sun by shade or insulation, or where large windows are exposed to the sun.
4. From Table 2, determine the number of minutes required per air change.
5. Estimate the air volume required and select the cooler from catalog capacity tables.

Note: If the cfm delivery required falls between two sizes of coolers, always use the larger size to obtain maximum comfort.

A specific cooling problem can be

Table 1—Time Required per Air Change as Related to Wet Bulb Depression

Time Required per Air Change	Approximate Wet Bulb Depression
3 min.	31 — 35 F
2 min.	26 — 30
1½ min.	20 — 25

2 FOR THE SECOND method, areas are grouped according to their humidity ratios. Air changes recommended for use in the different zones are shown below in Table 2

Table 2—Suggested Number of Minutes per Air Change

Interior Heat Load	Exterior Heat Load	Zone No. 1	Zone No. 2	Zone No. 3	Zone No. 4
Excessive:	Exposed:	2	1½	1	1
Excessive:	Protected:	3	2	1½	1
Normal:	Exposed:	3	2	1½	1
Normal:	Protected:	4	3	2	1½

Homes: Use Normal and Protected classification unless unusual condition exists.

WHY'S AND HOW'S OF EVAPORATIVE COOLING

This is the *fourth* in a series covering evaporative cooling.

ARTICLES SO FAR:

- **How evaporative cooling works (July issue)**
- **Types of coolers (August issue)**
- **Cooler design and construction (September issue)**
- **Sizing the cooler (this issue)**

ARTICLES TO COME:

- **Design of cooler installations**
- **The cooler industry and its sales**

used to show how this method works. Assume that a cooler must be selected for a variety store 20 ft wide and 50 ft long, with a 9 ft insulated ceiling, and located in Oklahoma City. Assume also a normal interior heat load and a protected exterior heat load. Fig. 2 indicates that this building is located in Zone 3 and Table 2 recommends an air change every two minutes. The volume of the building is found to be 9000 cu ft. Divide the number of cu ft of space to be cooled by the two minute air change to obtain the cfm air delivery required from the cooler, which in this case would be 4500 cfm.

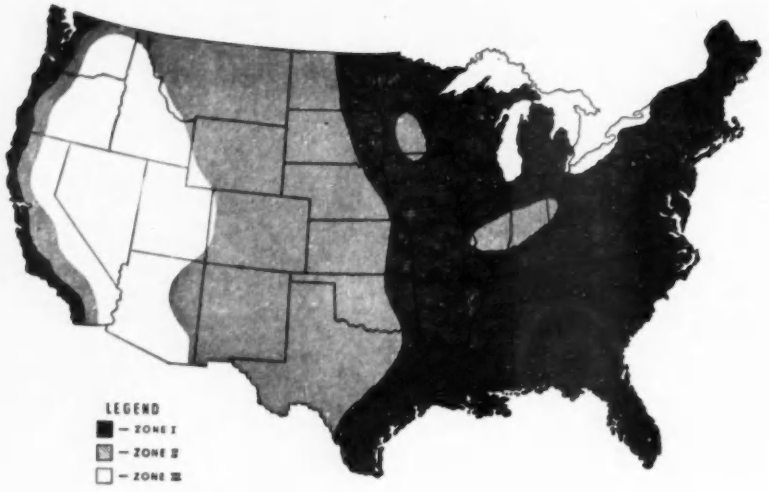
Referring to a manufacturer's catalog, it is found that there is a model rated at 4200 cfm and another model rated at 4800 cfm. The larger model is selected for use in this building.

Key Factor Numbers Used

For the third method of selecting the proper size cooler, an elaboration of the second method, Fig. 3 and Tables 3 and 4 are utilized. Fig. 3, like Fig. 2, is a zone map of the United States divided into three wet bulb depression areas. Table 3 gives cooling load points for three factors: internal heat load, construction heat load, and exposure heat load. In regard to the cooling load points for the internal heat load, a heavy cooling load would apply to structures within which large quantities of heat are generated in the normal use of the premises — such as a restaurant with its stoves and hot plates, a beauty shop with its hair dryers, or a theater with its large mass of people. A medium cooling load would apply to such applications as merchandise stores and offices, in which electric lighting and other heat sources within the building must be considered. A light cooling load would apply to residences and business buildings or offices in which little additional heat other than transmission gains must be taken into account.

In regard to cooling load points for the construction heat load, a heavy cooling load would apply to buildings which have no insulation; a medium cooling load would cover buildings which have moderate insulation; and a light cooling load would apply to a well insulated buliding. As to the cooling load points for exposure heat load, a heavy cooling load would apply where there is direct exposure to the sun; a medium cooling load would be considered applicable where the building was in moderate shade; and a light cooling load would be assigned where there was complete shade of the premises.

Table 4 lists *key factor numbers* based upon the total cooling load points taken from Table 3 and location with respect to the climate zones in Fig. 3. The key factor number when divided into the cubic content of the building to be cooled gives the required cfm air delivery.



3 FOR THE THIRD method, areas are divided into three wet bulb depression zones. The key factor numbers in Table 4 are based upon the cooling load points in Table 3 and these climate zones

Table 3—Cooling Load Points: Factors 1, 2, 3

Type of Cooling Load	Internal Heat Load	Construction Heat Load	Exposure Heat Load
Heavy	3	3	3
Medium	2	2	2
Light	1	1	1

Table 4—Key Factor Numbers

Cooling Load Points From Table 3	Climatic Zone—Fig. 3		
	1	2	3
9	1	1½	2
8	1	1½	2
7	1½	2	3
6	1½	2	3
5	1½	2½	4
4	2	3	4
3	2	4	5

A sample problem will illustrate this method of selecting evaporative coolers. Assume a dress shop in Reno, Nev., is located in the center store of a three store single story frame building. The building faces south and has no protecting shade. The cubic content of the store, a 20 × 40 × 12 ft structure, is 9600 cu ft. From Fig. 3 we see that our sample building is located in Zone No. 3. Using Table 3, we assign two points for medium internal heat load; three points for a heavy cooling load due to the building location with respect to exposure. This makes a total of eight points. Examining Table 4, we find that eight cooling load points assigned to a building in Zone 3 establishes a key factor number of 2. Dividing the cubic contents of the store, 9600 cu ft, by the key factor number, 2, we arrive at a required cfm of 4800, upon which the selection of the cooler is based.

Specific Load Method

A fourth method is quite detailed. To begin with, the proper outdoor conditions should be established from the ASHVE *Guide* table on summer climatic conditions (previously mentioned). From this table, the inside design conditions can be selected. Since the cooling effect that can be achieved by evaporative cooling is dependent on outside conditions, these must be known in order to select a possible indoor design. After the outdoor and indoor design conditions are established, the sensible heat load of the building should be calculated. The normal heat transfer by conduction through the walls, ceilings, floors, windows, as well as the solar heat gain, heat load from lights, appliances, occupants and other sources should all be totaled to provide the hourly sensible heat gain of the structure. When this figure is known, the quantity of air required can be readily determined.

In calculating the heat load, no attention need be paid to the latent heat, as the system operates on 100 per cent outdoor air, and therefore, any moisture pickup is discharged along with the air which is being exhausted to the outside. The amount of air circulated in an evaporative cooling system is so much larger than that used by any other type of cooling system that a high internal latent heat load does not appreciably raise the relative humidity within a room. For example, a latent load equal to 20 per cent of the sensible heat gain will raise the relative humidity approximately 3 per cent in a properly designed evaporative cooling system.

This method of determining the proper capacity for an evaporative cooler can be illustrated by the following example: Assume the building to be cooled is a grocery located in El Paso, Tex. Assume also that it is 50 ft × 140 ft, with a 14 ft ceiling, resulting in a store volume of 98,000 cu ft.

The outside design temperatures for this area are 100 F dry bulb and 69 F wet bulb. Referring to a phychrometric chart, we find the following outside air conditions exist at the design temperatures:

Dry bulb temperature	100 F
Wet bulb temperature	69 F
Dew point temperature	52 F
Relative humidity	20 per cent
Cu ft per lb	14.3
Wet bulb depression (100 — 69)	31 F

In American Artisan for July 1953, page 134, it is stated that a well designed evaporative cooler can be expected to lower the entering air temperature by an amount equal to approximately 80 per cent of the difference between the outside dry bulb and the wet bulb design temperatures. Thus, with a wet bulb depression of 31 F, this amount will be 25 F. With entering air at 100 F, it can, therefore, be expected that there will be an approximate delivery air temperature of 75 F. Then allowing a 10 F rise for the diffusion temperature, it can be expected that the room dry bulb temperature will be 85 F.

Using the ASHVE *Guide's* method of determining the total sensible heat load from transmission and appliance loads, we find the sum to be 150,360 Btu per hr.

Breakdown of Loads

A breakdown of these loads shows:

Shaded front glass	8,900 Btu per hr
Wall (less glass area)	23,700
Sun effect on one wall	6,470
Slab floor located on ground	0
Ceiling to attic (4 in. insulation)	15,800
People (300 persons)	18,000
Lights (14,000 watts)	47,740
Air cooled refrigeration compressors (5 hp total connected load)	17,000
Fan motors (3 hp)	7,635
Electric lights (1,500 watts)	5,115
Total sensible heat load	150,360

Because the cooler is to be selected on a cfm basis, it is desirable to reduce the heat load from Btu per hr to Btu per minute. Thus, 150,360 Btu per hr divided by 60 minutes = 2506 Btu per minute.

The next step is to convert the ability of the cooled air to pick up heat into actual Btu absorbed per lb of air handled. The formula used for the conversion is: Btu per minute ÷ temperature rise × specific heat of air = lb of air handled. Applying this formula to our problem, 2506 ÷ 10 F × 0.24 = 1042 lb of air. By multiplying the lb of air by the specific value of the air (1042 × 14.3), we find the cfm requirement (15,000).

Usually it is advisable to install several smaller coolers spaced throughout a building of this size rather than to rely upon one large cooler to do the complete job. In this case three 5000 cfm coolers would provide adequate cooling under design conditions.

It is interesting to note that the delivery of 15,000 cfm in this store building of 98,000 cu ft represents but one air change every six and one-half minutes, which is apparently due to using the more detailed method of calculating the heat load.

[Figs. 1 and 2 and Table 2 are courtesy International Metal Products Co. Fig. 3 and Tables 3 and 4 are courtesy Utility Appliance Corp.]

STUDY HEAT LOSS

THE EFFECT of relative humidity on the heat loss of men exposed to environments of 80, 76, and 72 F, was the subject of recent studies sponsored by the American Society of Heating and Ventilating Engineers and the U. S. Public Health Service, in cooperation with the University of Illinois' College of Medicine.

It was found that inactive men are equally comfortable at either 30 or 80 per cent relative humidity in temperatures ranging from 72 to 76 F. Their skin temperatures are higher at 80 per cent relative humidity than at 30 per cent. Compared with women in similar environments, men have higher skin temperatures and greater heat losses by evaporation.

Ten young, healthy men were studied over a period of three hours in each of the three temperature environments, at a relative humidity of either 30 or 80 per cent. Eight women were studied in similar temperature environments, at a relative humidity of 30 per cent.

IN ANOTHER SURVEY which adds to its extensive coverage of residential air conditioning, American Artisan shows . . .

HOW TO HUMIDIFY

with Warm Air Heating Systems

THE TERM *air conditioning* has a broad meaning, involving several functions. Both *summer air conditioning* and *winter air conditioning* require the equipment to perform at least four functions. The summer air conditioning system must deliver, filter, cool and dehumidify the air; the winter air conditioning system must deliver, filter, heat and humidify the air. Forced warm air is the only type of residential system capable of fulfilling economically all of the requirements of a complete air conditioning installation.

There is one function required of the winter air conditioning system that is too often overlooked — the humidification of the air. This is, unfortunately, true despite the fact that many home owners consider humidification a most important aid to their comfort, health and general well being. Some people have found that by turning on the shower or boiling water on the stove, the discomfort due to dried out winter-time air disappears for awhile. These makeshift methods can be forgotten and continuous humidification

provided through the installation of a humidifier; although the building construction, heat loss through windows, etc., may limit the possible humidity to something below the ideal.

Comfort alone is not the sole benefit of proper humidification, as tests conducted at the University of Chicago have indicated that certain wintertime diseases are less prevalent in buildings where proper humidity is maintained.

People are not alone in their need for moisture — without enough of it in the air, wooden furniture dries out at the joints, draperies and floor coverings lose their bright coloring, house plants die, musical instruments lose their tone.

Why a Shortage of Vapor during Winter?

If, during the summer, there seems to be a surplus of moisture in the air, then what causes a shortage of this vapor during the winter when it seems to be needed most? To find the answer to this, we must make a brief study of the air we live in. First, warm air has the ability to hold much more water vapor than cool air. Thus the term "relative humidity" has no real value when referring to air at different temperatures. For example, air at 80 F and 45 per cent relative humidity has 69 grains of moisture per lb of air, whereas air at 40 F and 90 per cent relative humidity has 33 grains per lb of air — less than one-half as much moisture as in the first example.

There is nothing we can do to add more than three and one-half grains of moisture to the 40 F air because air at 40 F and 100 per cent humidity will hold only 36.5 grains of moisture. All moisture added after the saturation point (100 per cent humidity) is reached will condense out of the air in the form of drops of water. Fortunately winter comfort conditions do not require high relative humidity, but they do require humidities higher than usually provided by nature during the coldest months. Most heating systems are designed and selected to provide their rated capacity at between zero and 10 below zero conditions, but in the majority of cases the average winter temperature will be between 10 and 20 F.

Suppose, for example, we select 15 F as the average temperature of a sample location. This means that there will be no more than 11.77 grains of moisture in the air. This air, when heated to 75 F, will have a relative humidity of less than 10 per cent. This is far too little moisture to satisfy the needs of people, plants and objects.

How Humidifiers Work

There is one way that moisture can be added to the air — and that is by the use of humidifiers. Humidifiers work in several ways, but generally they are either of the evaporative type or spray type.

One type of evaporative humidifier is designed to expose saturated surfaces of porous materials to a warm air stream passing through the furnace on its way to the living area. The warm dry air tends to absorb the water vapor and in turn to increase the relative humidity of the building.

A second evaporative type of humidifier is designed to expose a metal pan to the warm air stream and as water is permitted to either drop or stand in the pan, the heat from the air stream will cause evaporation to take place, thus adding moisture to the warm air stream as in the first case.

A third type of evaporative humidifier is a result of combining both the porous material and pan principles.

The spray type of humidifier is designed to inject a very fine mist of water into the air stream. There are several ways this is done — by the use of orifices, nozzles, or tubes with openings in them. Whatever the method used, it results in the addition of water vapor to the heated air while it is being delivered to the living area.

There is another way that moisture can be added to homes that are not provided with forced warm air distribution systems, and that is to place in several of the rooms vaporizing pots that are designed to discharge into the air certain quantities of water vapor, thereby raising the humidity in the general area.

Building Humidifier Sales

The warm air heating dealer can build a larger sales volume by stressing humidification along with all the other advantages of warm air heating in his conversations with his customers. Most people want to talk about humidity and how they can have it in thir homes.

There are several ways that humidifiers can be merchandised. The warm air heating dealer can have all service men carry a spare humidifier with them on all service calls. Wherever a call occurs at a home in which a humidifier is not installed, the serviceman will find a ripe prospect, because as he can point out, the customer can practically save the installation cost by having the installation made while the service man is already on the job. Another way to draw attention to the benefits of humidifiers is through the use of direct mail to every owner of a furnace in the area. The cost for this type of sales campaign is relatively low because the humidifier manufacturers will usually provide the literature.

Another place to stress the subject of humidification is in the showroom. Most manufacturers have displays that are real "sales getters," that tell the story in a hurry. A way of locating prospective purchasers of humidifiers is through the use of the pages of the local newspapers. This is one way of locating those people who have converted old gravity warm air systems into forced air systems. Mats for this type of advertising are also available from most manufacturers.

During the winter, humidification is needed. The warm air heating dealer is the man who makes it his business to tell the public about this aid to comfort, who can select the right equipment, and who can install it and service it properly.

Evaporative Type Humidifiers

Auto-Flo

Models available: One, with capacity to 150,000 Btu; overall dimensions, 8 × 16 in.; suitable for both gravity and forced warm air systems.

Evaporative plates: Porous ceramic material.

Pan material: Porcelain enameled steel.

Method of filling pan: Automatic, from city supply.

Water level control: Pressure balance device.

Overflow provision: Yes.

Brass and copper parts: Metering orifice.

Humidity control: By number of plates used.

Average installation time: 30 min.

Manufacturer: Auto-Flo Corp., 14590 Schaefer, Detroit 27, Mich.

Automatic Humidifier

Models available: 33, with pan sizes ranging from 52 to 272 sq in.; suitable for both gravity and forced warm air systems.

Counterflow furnace model: One for concrete plenums and one for metal plenums.

Pan material: Stainless steel.

Method of filling pan: Automatic, from city supply.

Water level control: Heat regulated thermostat.

Overflow provision: Yes.

Flushing provision: Yes.

Brass and copper parts: Used throughout water control assembly.

Humidity control: By air temperature and its affinity for moisture.

Average installation time: 30 min.

Manufacturer: Automatic Humidifier Co., 19th & Main Sts., Cedar Falls, Ia.

Cleveland

Models available: Eight models, with capacities from 60,000 to 420,000 Btu; dimensions, from 3 x 10 in. to 4 x 45 in.; suitable for both gravity and forced warm air systems.

Evaporative plates: Molded refractory material.

Pan material: Porcelain enameled steel.

Method of filling pan: Automatic, from city supply.

Water level control: Float valve and drip feed models available.

Overflow provision: Yes.

Brass and copper parts: Fittings and valve assembly.

Humidity control: By number of plates and manual selecting dial for rate of water admitted.

Average installation time: 45 min.

Manufacturer: Cleveland Humidifier Co., 7802 Wade Park Ave., Cleveland 3, O.

Combustioneer

Models available: Two, with overall dimensions of 12½ and 20⅞ in. long; suitable for both gravity and forced warm air systems.

Evaporative plates: Porous ceramic material.

Pan material: Corrosion resistant steel.

Method of filling pan: Automatic, from city supply.

Water level control: Dual valves.

Overflow provision: Yes.

Flushing provision: Yes.

Humidity control: Dial and number of plates.

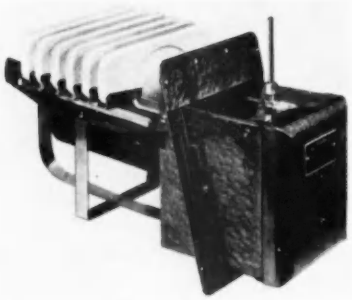
Average installation time: 1 hr, 30 min.

Manufacturer: Combustioneer Div., Steel Products Engineering Co., 1205 W. Columbia St., Springfield, Ohio.

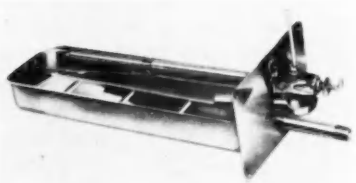
Maid-O'-Mist

Models available: 13, from 40,000 through 200,000 Btu, with overall dimensions from 15 to 34 in. in length, suitable for both gravity and forced warm air systems.

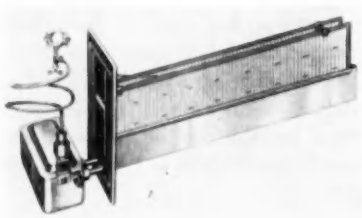
Counterflow furnace model: Yes.



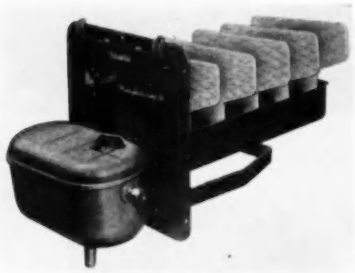
Auto-Flo Corp.



Automatic Humidifier Co.



Maid-O'-Mist, Inc.



Skuttle Mfg. Co.

Evaporative plate material: Corrugated asbestos paper.

Pan material: Copper.

Method of filling pan: Automatic, from city supply.

Water level control: Brass float valve.

Overflow provision: Yes.

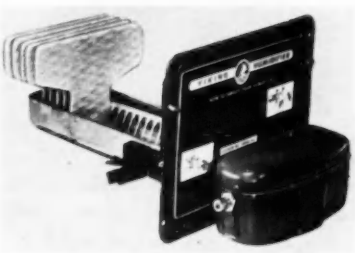
Flushing provision: Yes.

Brass and copper parts: Used throughout assembly.

Humidity control: By number of plates used.

Average installation time: 20 min.

Manufacturer: Maid-O'-Mist, Inc., 3217 N. Pulaski Rd., Chicago 41, Ill.



Viking Air Conditioning Corp.

Skuttle

Models available: Four, with capacities from 100,000 to 250,000 Btu; dimensions, from 3 x 12 in. to 7 x 24 in.; suitable for both forced warm air and gravity systems. .

Counterflow furnace model: Yes.

Evaporative plates: Spun glass material.

Pan material: Porcelain enameled steel.

Method of filling pan: Automatic, from city supply.

Water level control: Float valve.

Overflow provision: Yes.

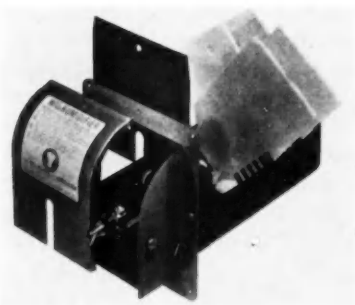
Flushing provision: Yes, if requested.

Brass and copper parts: Valve assembly.

Humidity control: By number of plates used.

Average installation time: 30 min.

Manufacturer: Skuttle Mfg. Co., 4099 Beaufait Ave., Detroit 7, Mich.



Econo-Matic Products Co.

Viking Air Conditioning

Models available: One model, expandable from 0 to 20 plates, with capacities up to 400,000 Btu; dimensions, 8⅜ in. high, 10⅜ in. wide, and 17⅜ in. long; suitable for both gravity and forced warm air systems.

Counterflow furnace model: Yes.

Evaporative plate material: Silica glass.

Pan material: Copper.

Method of filling pan: Automatic, from city supply.

Water level control: Float valve.

Overflow provision: Yes.

Brass and copper parts: Pan, plate rack, reservoir, valve assembly and splash cover.

Humidity control: Number of plates used.

Average installation time: 30 min.

Manufacturer: Viking Air Conditioning Corp., 5601 Walworth Ave., Cleveland 2, O.

Wet Wing

Models available: Two; overall dimensions, 5 x 13 in.

Evaporative plates: Spun glass material.

Pan material: Porcelain enameled material.

Method of filling pan: Automatic, from city supply.

Water level control: Float valve.

Brass and copper parts: Float ball and needle valve.

Humidity control: By number of plates used.

Average installation time: 45 min.

Manufacturer: Econo-Matic Products Co., Inc., 11803 Grand River Ave., Detroit 4, Mich.

Spray Type Humidifiers

Handelan

Method of obtaining spray: City water pressure and special spray assembly.

Spray control: Valve.

Angle of spray: Downward.

Humidity control: Manual.

Average installation time: 1 day.

Recommendations for installing: Attach in a warm air supply duct.

Manufacturer: Handelan Air Washer Co., 4006 Washburn Ave., S., Minneapolis 10, Minn.

Humidifying Equipment . . . . . for Warm Air Systems

Self-Contained Package Humidifiers

Daffin

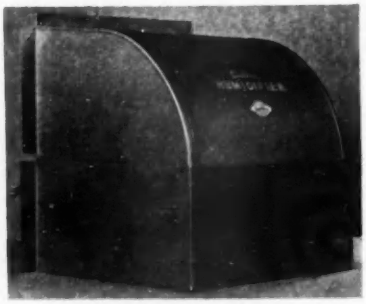
Method of humidification: Spray.
Motor specifications: 110 volts, 1/50 hp.
Water level control: Float valve.
Water level maintained: By piped supply.
Capacity: 97.5 cfm.
Dimensions: 13 in. high, 12 in. wide, and 12 in. deep.
Weight: 12 lb.
Manufacturer: Daffin Mfg. Co., 1204 N. Prince St., Lancaster, Pa.

Kauffman

Method of humidification: Evaporative or spray types available.
Motor specifications: 115 volts, 1/100 hp.
Water level control: Float valve if desired.
Capacity: 250 cfm.
Dimensions: 13 in. wide, 15 in. high.
Weight: 22 lb.
Manufacturer: Kauffman Air Conditioning Co., 4505 Olive St., St. Louis 8, Mo.

Walton

Method of obtaining spray: Centrifugal mechanical atomizer.
Material specifications: Non-ferrous, primarily copper.
Water flow: Controlled by float, with provision for overflow.
Overall dimensions: Height, 11½ in.; diameter, 10½ in.
Motor operation: Controlled by furnace fan or humidistat.
Average installation time: 1 hour.
Manufacturer: Walton Laboratories, Inc., 1186 Grove St., Irvington 11, N.J.



Daffin Mfg. Co.

Kauffman Air Conditioning Co.

PLAN STORING OIL IN OLD SLATE PITS

PLANS LOOKING toward the adaptation of abandoned slate pits in northeastern Pennsylvania as underground reservoirs for the seasonal storage of heating oil are being considered by the Esso Standard Oil Co.

"The successful, economical operation of these reservoirs," said William Naden, of Esso, "could mean the eventual utilization by the industry of the vast natural storage capacity that exists in many parts of the country. It could also mean a big step toward the practical solution of the problem of uneconomical peaks and valleys of seasonal production."

The storage operation would be carried out by removing water from the bottom of the pit as oil is pumped in at the surface. To insure that the water pressure on the walls of the pit would always be greater than the pressure of oil, the oil level would be held below the level of the surrounding water table. Any leakage would then be in the direction of water into the pit. Water seepage would be periodically pumped from the pit as necessary to keep the oil level below the water table.

When oil was to be removed in the heating season, the procedure would be reversed and water pumped into the pit below the level of the oil. This requires the use of a second quarry as a water reservoir to supply water to displace the oil and act as a safeguard against oil bearing water being pumped into natural streams and causing a pollution problem.

EXHAUST PROBLEM SOLVED

Perhaps the most dramatic feature of the Ford Motor Co.'s remodeled rotunda building, Dearborn, Mich., is its dome. Covered with a clear plastic "skin," this dome presented a unique heat exhaust problem which was solved by installing a power roof ventilator in the top of the dome, according to the De Bothezat Fans Div., American Machine and Metals, Inc.

The ventilator was especially made of aluminum to save weight and to match the framework of the dome. It has a 36 in. fan wheel which exhausts 5000 cfm at low speed and 8000 cfm at high speed.

SCHOOL BUILDING BOOM

STATISTICS RELEASED by the Metropolitan Life Insurance Co. predict a boom in public school construction over the next seven years to meet the needs of the expanding younger population. According to the statisticians, nearly half a million more school children must be taken care of this year in north central states.

That is only the start of the increase. By 1960, the number of five to 13 year olds in the area is expected to increase from 7,378,000 to 9,125,000. High school students are estimated to increase from 2,572,000 to 3,316,000.

Schools for 7½ million new scholars will be needed nationally over the coming seven years.

"Housing Census data for 1940 and 1950 can help us chart the replacement possibilities the market now offers." — C. E. Price

"Americans, now spending 80% of their time at home, benefit tremendously from heating improvements." — H. O. Chamberlain

"The committees which serve so unselfishly are responsible for the Association's commanding position." —W. D. Redrup

"Through planned advertising and promotion, we can create a strong customer desire for modernization." — H. C. Gurney

"Industry's merchanized progress has been paralleled by an important rise in domestic automatic devices." — R. H. Collacott

"Sales can double in '54 if each salesman makes five phone calls, personal calls, and mailings a day." — C. S. Stackpole

To Stress Selling

. . . at 40th convention of the National Warm Air Heating and Air Conditioning Association

SELLING AND NEW MARKETS for heating and cooling will be one of the main themes at the 40th annual convention of the National Warm Air Heating and Air Conditioning Association, to be held December 2 and 3 at the Hotel Cleveland, Cleveland. New developments and the latest research findings also will be covered. The program will be keyed to all segments of the industry — dealers, wholesalers, and manufacturers, according to M. I. Levy, program committee chairman.

Elmer Wheeler, salesman, and C. S. Stackpole, Eureka Williams Corp., will be two of the major speakers treating the selling theme. Mr. Wheeler will be the guest speaker at the first day's luncheon. In line with the emphasis on increasing business volume, the economic aims of trade associations will be discussed by R. H. Collacott, Standard Oil Co.

Market potentials based on the 1950 Housing Census will be presented by C. E. Price, American Artisan, and an official from the National Association of Home Builders will discuss the potentials of the 1954 new home

field. H. C. Gurney, chairman of the association's publicity and merchandising committee will report on how the association is aiding the industry in reaching this market through its publicity program.

The modernization market will have to provide a more substantial part of 1953's heating and cooling sales than in previous years, according to the association. Therefore, modernization opportunities will be discussed at the convention along with information on the new home market. H. O. Chamberlain, Minneapolis-Honeywell Regulator Co., and C. L. Staples, Domestic Engineering, will present information on these opportunities.

Association Plans to Be Described

NWAHACA activities and objectives will be presented during the second day's program. Reports by the various association committee chairmen will reveal the work completed during the past year and plans for the coming year that will keep the industry "moving ahead."

Plans for the new business administration conferences sponsored by The Sheet Metal Contractors National Association and The National Heating Wholesalers Association will be presented by A. J. Sabathne, president of SMCNA.

Research reports on the summer air conditioning investigations in Research Residences 2 and 3 along with results of the 4 in. pipe perimeter system tests will be presented by personnel from the University of Illinois.

The second day's luncheon will have as its guest speaker Colonel Jack Major, the humorist. Arrangements for the two luncheons and the social hour scheduled for the evening of December 2 are being handled by Frank Gibbons, chairman, entertainment committee.

Registration fees will be $5.00 per representative of member companies. Registration fees for representatives of companies not members of the association are as follows: Manufacturers $15.00; wholesalers, jobbers, distributors and manufacturer's agents, $10.00; and dealers $7.50.

THE PROGRAM committee for the 40th annual convention includes *(top row, l. to r.)* chairman, M. I. Levy, Viking Air Conditioning Corp.; J. W. Norris, Lennox Furnace Co.; E. P. Hayes, The C. A. Olsen Mfg. Co.; E. A. Norman, Jr., Norman Products Co.; *(bottom row, l. to r.)* J. N. Crawford, Affiliated Gas Equipment Co.; S. J. Levine, General Electric Corp.; W. G. Van Etten, Conco Engineering Works; H. F. Curtis, Auer Register Co. (J. F. Deane, International Sales Co., not pictured)

Program

40th Annual Convention
National Warm Air Heating and Air Conditioning Association
Hotel Cleveland, Cleveland, Ohio
Dec. 2 and 3, 1953

Morning, December 2, 1953

40 Years of Progress
W. D. Redrup, president, NWAHACA
Economic Aims of the Association
R. H. Collacott, The Standard Oil Co.
To Sell Ya Gotta Tell
C. S. Stackpole, Eureka Williams Corp.
The Future of New Home Building
An official of the National Association of Home Builders
LUNCHEON SESSION
Selling the Sizzle
Elmer Wheeler, Sizzle Ranch, Tex.

Afternoon, December 2, 1953

Nomination and election of officers and members of the board of trustees.
Market Potentials Based on 1950 Housing Census
C. E. Price, American Artisan
Bay City Story on Heating
C. L. Staples, Domestic Engineering
Participation in the Modernization Market
H. O. Chamberlain, Minneapolis-Honeywell Regulator Co.
Publicity and the Market
H. C. Gurney, chairman, publicity and merchandising committee
ADJOURNMENT
COCKTAIL PARTY — 5:30 p.m.

Morning, December 3, 1953

Membership Growth
G. W. Denges, The Williamson Heater Co.
More Profits in Commercial and Industrial Work
R. C. Jaye, president, Syncromatic Corp.
Progress in Research
F. L. Meyer, The Meyer Furnace Co.
What's Happening in the Field
C. W. Nessell, Minneapolis-Honeywell Regulator Co.
Legislation
C. L. Sapp, Farquhar Furnace Co.
Traffic and Tariff
E. F. Hurkman, Lennox Furnace Co.
Educational Advisory Board Panel
Chairman, L. G. Miller, technical consultant
E. B. Root, Superior Safety Furnace Pipe Co.
W. C. DeRoo, Hart & Cooley Mfg. Co.
F. W. Brundage, The Brundage Co.
Ross Wallis, Meyer Heating & Sheet Metal
C. L. Grandstaff, The C. A. Olsen Mfg. Co.
L. A. Miles, L. J. Mueller Furnace Co.
N. T. Hess, Vorys Brothers, Inc.
G. A. Voorhees, technical secretary of association
B. F. McLouth, The Sales Engineer
Report on Business Administration Course
A. J. Sabathne, president, Sheet Metal Contractors National Association
LUNCHEON SESSION
Taxes, Women, and Hogs
Colonel Jack Major

Afternoon, December 3, 1953

Small Pipe Heating in Research Residence No. 2
H. T. Gilkey, University of Illinois
Summer Cooling in Research Residence No. 3
Using a Perimeter Loop System
D. R. Bahnfleth, University of Illinois
Summer Cooling in Research Residence No. 2
H. T. Gilkey, University of Illinois
ADJOURNMENT

Housing Census Heating Data

Baltimore • Cleveland • Milwaukee • Shreveport • Spokane • Wichita

SUGGESTIONS on how a warm air heating dealer can use some of the housing data available from the Bureau of Census were given in the May 1953 American Artisan. Localities covered in the reports are metropolitan areas that are socially and economically integrated with the central city. Data for various areas has been reported in American Artisan for June to September, inclusive. Additional reports will appear regularly.

Types of Fuel Used in Centrally Heated Dwelling Units

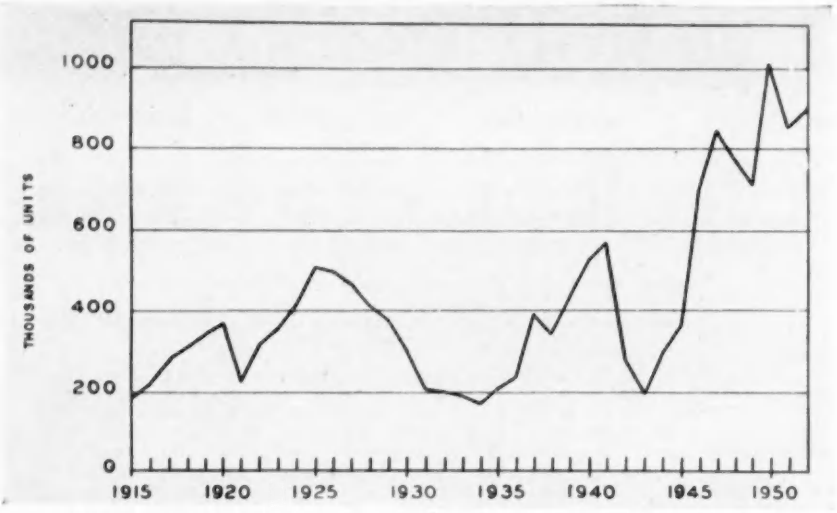
Subject	Standard Metropolitan Areas										
	Baltimore Md.				Cleveland Ohio			Milwaukee Wis.	Shreveport La.	Spokane Wash.	Wichita Kan.
	The area	Baltimore City	Arundel County	Baltimore County	The area	Cuyahoga County	Lake County	Milwaukee County	Caddo Parish	Spokane County	Sedgwick County
All dwelling units	392,263	277,880	36,345	78,038	438,902	414,889	24,013	253,384	52,477	72,505	73,829
Number reporting heating equipment	362,165	263,520	27,175	71,470	424,820	403,410	21,410	247,905	45,820	67,520	68,280
Central heating	291,095	216,070	17,255	57,770	346,660	330,785	15,875	205,505	4,935	40,805	41,615
Coal	81,220	61,485	5,145	14,590	169,325	158,255	11,070	149,160	100	26,865	1,810
Wood	770	300	165	305	860	810	50	615	25	1,190	110
Utility gas	38,125	31,530	470	6,125	159,695	159,365	330	21,680	4,710	635	37,770
Bottled gas	970	635	90	245	680	665	15	370	25	50	435
Liquid fuel	163,040	117,150	11,090	34,800	11,915	7,795	4,120	30,375	5	9,275	580
Other fuel	4,805	3,070	270	1,465	2,320	2,070	250	2,365	15	2,385	655
Not reported	2,165	1,900	25	240	1,865	1,825	40	940	55	405	255

Types of Nonfarm Dwelling Units, by Type of Heating and Year Built

Subject	Total occupied						Owner occupied			Renter occupied					
	Total	1 dwelling unit, detached	Other 1, and 2 dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit	10 dwelling unit or more	Total	1 dwelling unit, detached	All other dwelling units	Total	1 dwelling unit, detached	Other 1, and 2 dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit	10 dwelling unit or more
Standard Metropolitan Area of Baltimore, Md.—Arundel and Baltimore Counties															
All occupied units	352,060	82,800	202,425	37,110	18,840	10,885	193,200	67,680	125,520	158,860	15,120	82,020	32,845	18,265	10,610
HEATING EQUIPMENT															
Central heating	280,663	64,847	163,371	26,591	15,767	10,087	168,526	56,466	112,060	112,137	8,381	55,489	23,026	15,353	9,888
Piped steam or hot water	196,286	41,819	108,015	22,814	13,731	9,907	112,040	37,052	74,988	84,246	4,767	36,474	19,903	13,363	9,739
Warm air furnace	84,377	23,028	55,356	3,777	2,036	180	56,486	19,414	37,072	27,891	3,614	19,015	3,123	1,990	149
Noncentral heating, with flue	52,197	13,939	28,642	7,602	1,759	255	17,850	8,840	9,010	34,347	5,099	20,083	7,151	1,759	255
Nonctrl. htng., without flue; or not htd.	12,454	2,477	7,106	2,181	526	164	4,022	1,391	2,631	8,432	1,086	4,626	2,068	503	149
Not reported	6,760	1,539	3,316	738	787	380	2,811	985	1,826	3,949	554	1,824	603	649	319
YEAR BUILT															
1945 or later	34,884	13,380	17,002	2,472	1,487	543	23,160	11,986	11,174	11,724	1,394	5,883	2,417	1,487	543
1940 to 1944	39,213	11,859	20,079	3,279	1,994	2,002	19,293	9,151	10,142	19,920	2,708	10,156	3,142	1,912	2,002
1939 or earlier	266,932	54,786	160,305	29,879	14,457	7,505	146,392	44,947	101,445	120,540	9,839	63,418	25,969	13,992	7,322
Not reported	11,025	2,773	5,033	1,480	903	836	4,350	1,593	2,757	6,675	1,180	2,559	1,316	876	744
Standard Metropolitan Area of Cleveland, Ohio—Cuyahoga and Lake Counties															
All occupied units	412,795	191,215	109,930	47,615	26,670	37,365	221,265	167,685	53,580	191,530	23,530	66,190	39,685	25,275	36,850
HEATING EQUIPMENT															
Central heating	334,155	165,657	87,011	28,225	18,813	34,469	195,709	150,497	45,212	138,446	15,140	49,359	22,210	17,621	34,116
Piped steam or hot water	87,089	26,804	11,261	6,567	10,936	31,521	29,809	23,689	6,120	57,280	3,115	7,188	5,328	10,378	31,271
Warm air furnace	247,066	138,853	75,750	21,658	7,877	2,945	165,900	126,808	39,092	81,166	12,025	42,171	16,882	7,243	2,845
Noncentral heating, with flue	66,157	21,217	19,684	16,928	6,491	1,837	21,395	14,355	7,040	44,762	6,862	14,527	15,238	6,313	1,822
Nonctrl. htng., without flue; or not htd.	6,747	1,934	1,920	1,583	933	377	1,798	1,106	692	4,949	828	1,455	1,425	908	333
Not reported	5,726	2,422	1,312	879	432	681	2,361	1,725	636	3,365	697	847	811	432	578
YEAR BUILT															
1945 or later	34,323	29,602	1,940	851	562	1,368	29,860	28,639	1,221	4,463	963	915	825	392	1,368
1940 to 1944	29,313	20,598	3,291	1,250	1,675	2,499	20,432	19,084	1,348	8,881	1,514	1,969	1,224	1,675	2,499
1939 or earlier	340,609	137,427	103,152	44,109	23,502	32,419	168,572	117,943	50,629	172,037	19,484	61,838	36,389	22,345	31,981
Not reported	8,554	3,589	1,551	1,407	931	1,076	2,403	2,020	383	6,151	1,569	1,470	1,250	863	999

Types of Nonfarm Dwelling Units, by Type of Heating and Year Built

Subject	Total occupied						Owner occupied			Renter occupied					
	Total	1 dwelling unit, detached	Other 1, and 2 dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit	10 dwelling unit or more	Total	1 dwelling unit, detached	All other dwelling units	Total	1 dwelling unit, detached	Other 1, and 2 dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit	10 dwelling unit or more
Standard Metropolitan Area of Milwaukee, Wis.—Milwaukee County															
All occupied units	240,300	97,080	89,310	23,425	12,420	18,065	118,500	80,610	37,890	121,800	16,470	55,980	19,855	11,695	17,800
HEATING EQUIPMENT															
Central heating	196,182	81,295	70,576	16,242	11,072	17,197	102,780	70,492	32,288	93,402	10,803	41,737	13,485	10,434	16,943
Piped steam or hot water	71,561	19,128	20,351	7,822	8,113	15,947	25,758	15,851	9,887	45,623	3,277	12,390	6,454	7,699	15,803
Warm air furnace	124,821	62,167	50,025	8,420	2,959	1,250	77,042	54,641	22,401	47,779	7,526	29,347	7,031	2,735	1,140
Noncentral heating, with flue	36,743	12,990	16,391	6,048	1,066	248	12,878	8,212	4,666	23,865	4,778	12,455	5,364	1,031	237
Nonctrl. htng., without flue; or not htd.	5,187	1,867	1,910	833	147	430	1,784	1,233	551	3,403	634	1,423	769	147	430
Not reported	2,193	932	632	299	136	194	1,059	678	381	1,134	254	367	255	84	194
YEAR BUILT															
1945 or later	18,808	13,871	2,332	1,641	609	355	12,881	11,896	985	5,927	1,975	1,424	1,564	609	355
1940 to 1944	12,358	8,971	2,704	503	53	127	9,652	8,477	1,175	2,706	494	1,529	503	53	127
1939 or earlier	204,400	73,164	82,820	20,418	11,179	16,819	94,759	59,481	35,278	109,641	13,683	51,896	16,950	10,558	16,554
Not reported	4,730	1,070	1,454	864	580	762	1,200	750	450	3,530	320	1,134	838	476	762
Standard Metropolitan Area of Shreveport, La.—Caddo Parish															
All occupied units	45,970	35,025	7,010	2,510	1,145	280	23,395	21,295	2,100	22,575	13,730	5,275	2,235	1,065	270
HEATING EQUIPMENT															
Central heating	4,644	3,716	530	195	148	55	3,549	3,309	240	1,095	407	341	177	125	45
Piped steam or hot water	1,643	1,204	239	111	44	45	1,103	1,023	80	540	181	182	111	21	45
Warm air furnace	3,001	2,512	291	84	104	10	2,446	2,286	160	555	226	159	66	104	...
Noncentral heating, with flue	5,119	4,150	617	284	53	15	2,692	2,569	123	2,427	1,581	523	266	42	15
Nonctrl. htng., without flue; or not htd.	32,258	25,892	5,311	1,964	911	180	14,906	13,370	1,536	17,352	10,522	4,047	1,726	877	180
Not reported	3,947	3,266	553	66	32	30	2,247	2,047	200	1,700	1,219	364	66	21	30
YEAR BUILT															
1945 or later	8,557	7,677	624	55	201	...	6,589	6,421	168	1,968	1,256	456	55	201	...
1940 to 1944	3,180	2,828	234	89	29	...	2,444	2,354	90	736	474	178	55	29	...
1939 or earlier	32,531	23,617	5,710	2,173	800	231	13,840	12,120	1,720	18,691	11,497	4,311	1,932	720	231
Not reported	1,692	903	442	193	115	39	513	401	112	1,179	502	330	193	115	39
Standard Metropolitan Area of Spokane, Wash.—Spokane County															
All occupied units	64,095	46,235	4,520	3,070	3,840	6,430	41,970	39,315	2,655	22,125	6,920	2,820	2,610	3,545	6,230
HEATING EQUIPMENT															
Central heating	39,410	27,514	2,501	1,614	2,348	5,433	26,805	24,931	1,874	12,605	2,585	1,387	1,274	2,075	5,286
Piped steam or hot water	10,571	2,639	715	590	1,465	5,162	2,872	2,195	677	7,699	444	492	390	1,318	5,055
Warm air furnace	28,839	24,875	1,786	1,024	883	271	23,933	22,736	1,197	4,906	2,139	895	884	757	231
Noncentral heating, with flue	21,573	16,480	1,757	1,332	1,404	600	13,448	12,768	680	8,125	3,712	1,231	1,212	1,383	587
Nonctrl. htng., without flue; or not htd.	2,096	1,508	219	123	65	181	1,218	1,165	53	878	343	179	123	65	168
Not reported	1,010	730	42	...	22	216	495	448	47	515	282	22	...	22	189
YEAR BUILT															
1945 or later	8,344	7,619	309	129	103	184	7,247	7,087	160	1,097	532	176	102	103	184
1940 to 1944	7,099	5,141	228	508	1,038	184	4,691	4,635	56	2,408	506	201	508	1,009	184
1939 or earlier	47,124	32,641	3,854	2,399	2,539	5,691	29,326	26,999	2,327	17,798	5,642	2,367	1,966	2,303	5,520
Not reported	1,525	833	129	34	158	371	704	593	111	821	240	76	34	129	342
Standard Metropolitan Area of Wichita, Kan.—Sedgwick County															
All occupied units	64,815	40,720	9,865	7,560	4,115	2,555	36,835	33,080	3,755	27,980	7,640	7,295	6,830	3,805	2,410
HEATING EQUIPMENT															
Central heating	39,854	26,606	5,215	3,943	2,241	1,829	26,105	23,659	2,346	13,729	2,947	3,582	3,467	2,055	1,698
Piped steam or hot water	5,857	2,769	424	568	647	1,449	2,818	2,516	302	3,039	253	352	441	570	1,423
Warm air furnace	33,977	23,837	4,791	3,375	1,594	380	23,287	21,143	2,144	10,690	2,694	3,230	3,026	1,485	275
Noncentral heating, with flue	20,778	11,994	3,686	3,101	1,548	449	9,157	8,122	1,035	11,621	3,872	2,989	2,879	1,445	436
Nonctrl. htng., without flue; or not htd.	2,906	1,254	739	378	305	230	896	728	168	2,010	526	571	378	305	230
Not reported	1,298	869	226	137	20	46	678	574	104	620	295	154	105	20	46
YEAR BUILT															
1945 or later	10,453	8,288	1,102	857	82	124	7,741	7,357	384	2,712	931	791	784	82	124
1940 to 1944	12,327	5,647	3,045	2,598	1,037	...	5,882	5,045	837	6,445	602	2,621	2,579	843	...
1939 or earlier	40,395	25,874	5,541	3,713	2,861	2,406	22,711	20,205	2,506	17,684	5,669	3,734	3,275	2,745	2,261
Not reported	1,640	911	176	392	136	25	501	473	28	1,139	438	148	392	136	25



ACCEPTANCE OF FORCED warm air heating for all types of buildings has been constantly growing for many years, as the figures on production and shipments of furnaces indicate

Warm Air Heating Industry Answers a Misinformed Editor

Contractors, engineers and manufacturers, refuting a recent "editorial" in a newspaper, point out that warm air heating systems assure an adequate supply of fresh air, are designed by qualified people and operate under codes which protect the public

THERE HAVE recently appeared in a few small newspapers published in various parts of the country items which seem to be trying to decrease the public's confidence in and acceptance of warm air heating systems. The items all seem slanted in a way that indicates some relation between them.

An open letter in answer to such an "editorial" appears on page 55 of this issue.

The so-called "editorial" purported to quote from the United States Public Health Service reprint bulletin No. 2179, by J. M. Dalla Valle and Alexander Hollaender. This bulletin was published on July 12, 1940 and dealt with the role of ventilating systems in the transmission of bacteria spores. It said nothing about warm air heating systems. Any type of heating system used with a ventilating system for buildings such as those used in the experiments (a large building and an auditorium) would have resulted in the same findings. Yet this bulletin was used as basis for the attempted discrediting of warm air heating systems.

Tests Misinterpreted

The phrasing of the editorial was such that only parts of the findings of the tests conducted were used. This meant misinterpreting the entire findings of the authors, who summarized the results of the tests with, "Nevertheless, the data indicate that bacteria may be spread by a ventilating system, and lead to the conclusion that, especially in crowded spaces with a high degree of air recirculation, the potentiality is such as to merit further study from the public health standpoint." This test was made in 1940 and, so far as anyone has been able to determine, no further tests have been conducted since. If they have, nothing has been uncovered which indicates that such undesirable situations existed.

The editorial printed in bold face letters the words "disease-breeding" — yet these words do not appear anywhere in the bulletin, nor is any reference made even to the suspicion that such is the case. The bulletin describes the methods by which the tests were made and the measurement of bacteria spores throughout the entire ventilating system 15 minutes after introduction of the spores and for one hour after introduction. The tests showed that of the 103.1 spores added to 10 cu ft

of air, 21.9 spores per 10 cu ft remained after 15 minutes in one test. One hour after the introduction of the bacteria, there were no longer any spores in the tested samples. The authors stated, "It is worth noting that the concentration of spores drops rapidly after spraying has ceased, so that in a relatively short time the bacterial population returns to its normal level. The decrease may be attributed to the dilution factor, the action of the filter, and loss to surfaces, such as walls, floors, and the like."

Some Informed Comment

The American Artisan has invited a number of well informed and experienced heating contractors, engineers and manufacturers to comment upon the insinuations of the above-mentioned editorial. Their comments show how wrong the statements in the editorial are.

Says one engineer: "The condition of the air within the classroom depends upon the amount of fresh air which is introduced together with the proper filtration, humidification and circulation within the room. As long as sufficient fresh air is introduced and stale air exhausted, the air within the room will not be a 'source of disease breeding,' as incorrectly stated in the editorial. This principle is recognized in the heating and ventilating of office buildings, theaters, churches and the like, and the American Society of Heating and Ventilating Engineers has set up minimum fresh air requirements for most of these buildings. The local governing bodies usually follow the recommendations of this society in setting up their own local codes."

Says another: "We do not think that there have to be any actual tests or studies made of warm air heating systems in school buildings. All modern schools are heated with forced warm air heating systems of one type or another. Only by using mechanical means of introducing fresh air and distributing the air within the building or within the indvidual rooms can proper heating and ventilating systems be installed in schools."

Systems Designed by Qualified Engineers

Another points out: "The newspaper editor did not bother to verify the basis of his statements. If the editor had merely reached for the phone and called the design engineer who drew up the plans, he would find that the heating system had been designed to comply with the state code for school house heating systems. The editor is apparently unaware that the heating systems for public buildings must be designed by registered professional engineers and that the laws governing the requirements for registering engineers are written so that only qualified engineers can become registered. Such a system has been set up to protect the public from heating systems that do not provide enough air movement for good health."

Another says: "I fail to see why anyone should be excited about air circulation through a system from one schoolroom to another. Probably the schoolrooms do not have an occupancy greater than 40 children each. As a matter of interest, there is a school in this community having a room that often seats 6146 students for two hours or more. When the doors open, the room empties and another group of 6146 students occupy the room. Despite the fact that a large percentage of the air in this room is recirculated air, it is my opinion that neither the engineering profession nor the medical profession consider this room to be in any way any sort of a hazard to public health."

Bacteria Not Increased

Says another: "While it is true that a circulating air system will remove the bacteria from the room and then bring them back, the number of bacteria is not increased — in fact, a few of them may get lost on the way. In a properly designed system, there is provision for admittance of outdoor air which will force some of the 'foul air' to be removed from the space, carrying with it some of the bacteria.

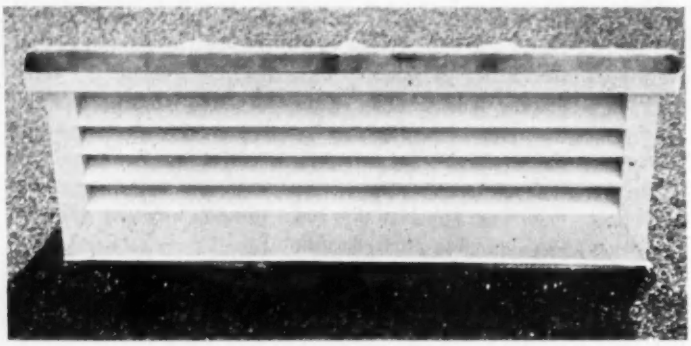
"There are literally billions of cu ft of air being circulated every minute of the day throughout the country. Should the newspaper editor quoted be correct in his assumptions, he has discovered something that has been by-passed by engineers and medical people for half a century. The fact that the air is removed from the room and returned does not make it any worse than if the air is 'just plain left' in the room."

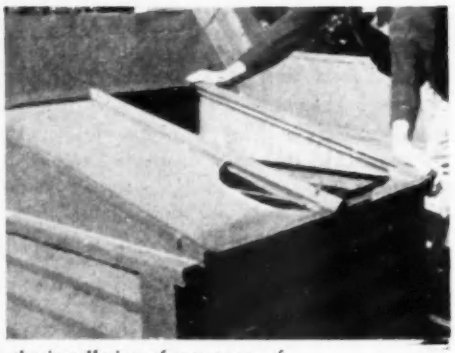
Another remarks: "Warm air heating has, we all know, become one of the most popular types of heating for schools and other public buildings because of the many advantages that it does offer. One of these advantages very definitely is the improvement in air circulation within the building, with a resulting improvement in the actual quality of the air being circulated. Practically all schools or auditorium jobs include in the installation a provision for the introduction of a considerable amount of outside fresh air. This means that the air within the building is being continually replaced with fresh, outside air. This is particularly important, as you know, in any auditorium or schoolroom where a quantity of people are gathered.

"It is impossible to conceive that air being distributed by a warm air system, as described above, or even air merely being circulated, could be any fouler than air which is stagnant within a room and is not being circulated. The objections raised in this editorial are completely without foundation and they are deliberately misleading without any particular record or fact."

A contractor says: "I have installed warm air heating in schools, churches, and public buildings of a varied nature for 45 years, and my experience proves that the statements in the editorial are definitely false, and without fact. I have never heard of one case where anyone ever became ill or contracted any disease from the air recirculated by a warm air heating plant."

Enough said! Perhaps we shouldn't even bother to answer such an inaccurate and misguided editorial. But it made us mad.





THERE ARE GROWING opportunities for sheet metal men in the installation of new types of skylights, such as the fiber glass-reinforced plastic one *(left)* and the reconditioning of older ones, such as the 40 year old skylight *(right)* which was damaged in a hail storm

A LARGE SKYLIGHT over a U. S. Navy installation *(left)* is inspected prior to glazing. Another big skylight completely roofs a florist shop *(right)*

Skylights — an Upward Trend

By Lawrence E. Gichner
Sheet Metal Contractor

New glass-walled buildings testify to a growing interest in admitting a maximum of daylight to commercial structures. This heralds an increase in the use of skylights as well. The author describes recently developed types, gives hints on reconditioning skylights

THE BUILDING OF SKYLIGHTS, once a substantial part of the business of most general sheet metal shops, has diminished in volume to the vanishing point compared with previous decades. Trends today, however, indicate that a revival is underway — that skylights probably will be used once again on an extensive scale.

The popular vogue of a few years ago to design commercial buildings without windows dealt a heavy blow to skylight buildings. However, there seems now to be a swing in the opposite direction in commercial building. The United Nations and Lever Brothers buildings, with their walls of glass, are examples.

No More "Jerry Built" Skylights

Why have so many architects erased skylights off their drawing boards and buildings? The basis for their complaints has been the "jerry built" skylight that may give no end of trouble, letting in both dust and rain. Rather than worry with these annoying factors, the architect eliminates skylights.

But skylights need not be a cause of trouble. Where a competent contractor constructs the job, neither dust nor water will enter. There are thousands of skylights, large and small, that have been in existence for many

years and are today in as excellent condition as at the time of installation.

New Types Developed

Several types of new pressed dome skylights coming on the market have many advantageous features. They are light and easy to install. The amount of illumination they provide is as great as, if not greater than, the one and two pitch lights with metal sides and 1/4 in. glass that have been the standard for the past 50 years.

The new skylights are limited, of course, as to size, and the test of time has yet to reveal their defects, if any. But examination by this writer of a number of these skylights erected over the corridor of a school building at set intervals showed the area below to be flooded with a wide and even illumination.

Translucent plastic dome skylights are being used increasingly in residential construction as well. For example, in a new 96 unit housing development in the Chicago area, all single floor buildings are being provided with bathroom skylights of this type (since the bathrooms are all located away from any outside wall). The architect plans to continue using such skylights on all future one story homes which he designs.

Another new type of skylight, the "Wright Light," produced by a Washington, D.C., sheet metal contractor, has been developed during the past year. It is made of plastic, reinforced with glass fiber. Lightweight and strong, it is designed for rapid, easy, installation. Standard dimensions of the skylight are 30 x 30 in.

The manufacturer recommends this skylight for installation over corridors, cafeterias and waiting rooms in a 14 in. width (by any desired length), since this width fits over the standard opening between joists without requiring installation of headers. Bases may be constructed of various materials — copper, aluminum, monel, stainless steel, or galvanized iron. The skylight gives 60 per cent of the illumination of glass.

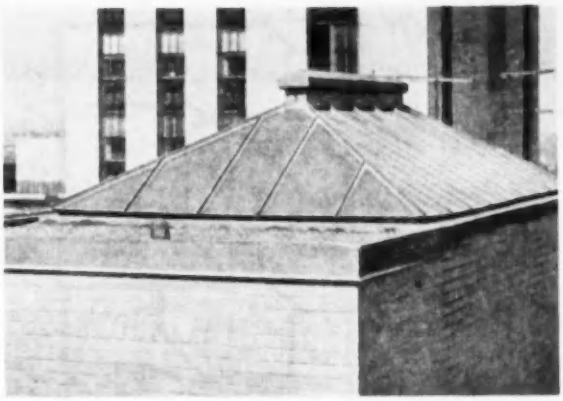
Avoiding Weep Hole Trouble

In addition to working with new types of skylights, the sheet metal man can do much work in reconditioning old ones.

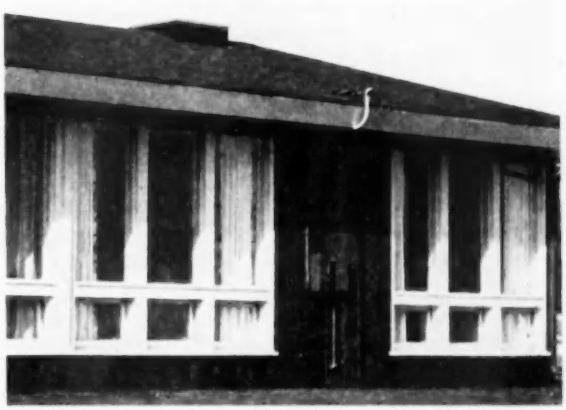
The writer's firm is reconditioning over 60 skylights on the buildings at the U.S. Naval Academy in Annapolis. These skylights vary in size from a few feet to over 100 ft in length.

Made of copper with cast iron bars, they have been installed about 50 years. Close examination revealed that where trouble existed it was directly traceable to weep holes becoming stopped up with dust. This allowed condensation to lay in the gutter, and with time, the moisture rusted out the bars at the base where water lay.

The weep holes were less than the size of a dime, and though this may seem quite ample to let water thru, it still was not sufficient to keep dust particles from solidly clogging up the openings. The weep holes were placed in the base gutter midway between the bars. It is believed they would have worked more efficiently if they were placed where the bar and gutter join.



MONEL IS USED in the skylight on the new Lever Brothers building in New York City



TRANSLUCENT PLASTIC dome skylights are used in the bathrooms of all one story homes in a new housing development (since the bathrooms are located away from any outside wall)

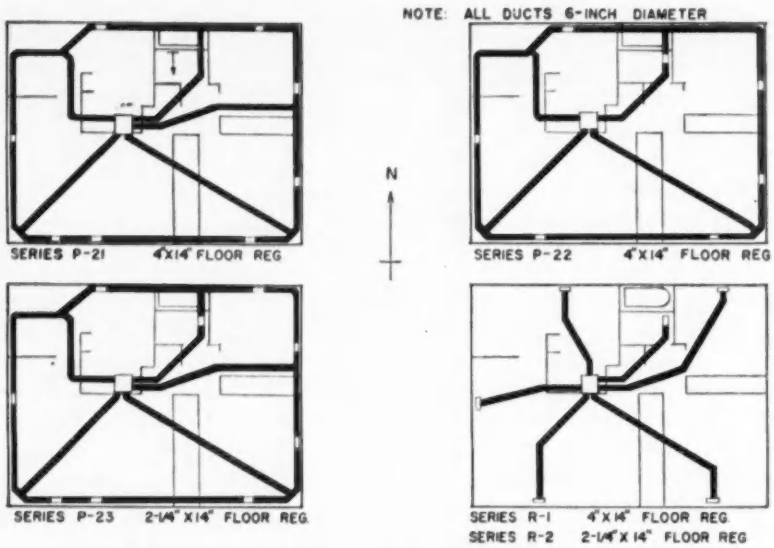
The dirt particles in the gutters were caused by an accumulation of bugs which tried to escape that way.

This observed weakness in skylight construction can be readily corrected either by larger weep holes or by building the skylight completely of copper, monel or stainless steel.

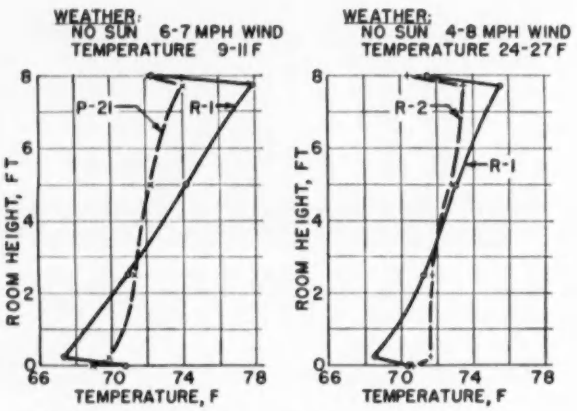
Publicity Needed

The slogan, "Nothing man-made equals natural light," might well be used by sheet metal men interested in doing more business in skylights. One selling argument might be, "Why pay for artificial daylight when you can have thousands of hours of it free."

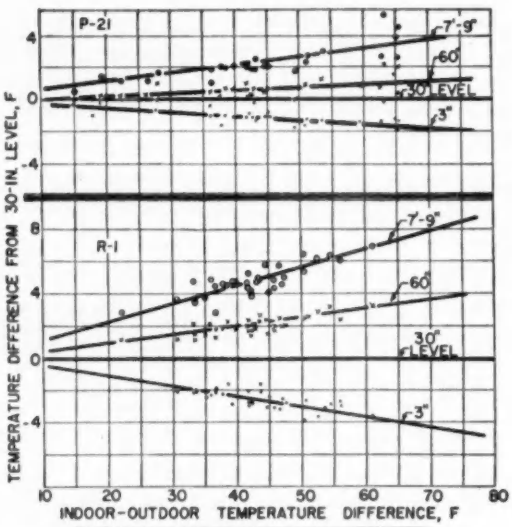
Believing that skylights are here to stay, the Sheet Metal Contractors National Association is in the midst of preparing a manual on standard practice for skylight construction. Any individual, company, or manufacturer who has ideas in this field has been invited to contact William J. Perkinson, 412 N. Walcott Ave., Chicago, chairman of the manual committee.



1 PERIMETER-LOOP and perimeter-radial systems (with 6 in. ducts), installed in a small test residence . . .



2 PROVIDED LOW vertical room-air temperature differentials (shown here for the north bedroom) . . .



TEMPERATURE DIFFERENTIALS, F								
	INDOOR-OUTDOOR DIFFERENCE							
	35F				70F			
	P-21	P-23	R-1	R-2	P-21	P-23	R-1	R-2
3"FL - 30"FL	0.8	1.2	2.1	1.0	1.7	2.0	4.2	1.0
3"FL - 60"FL	1.4	1.4	3.7	2.6	3.0	2.4	7.6	2.3
3"FL - 3"CLG	2.8	2.3	5.9	3.2	5.5	3.3	12.0	3.3

3 GOOD RESPONSE to outdoor temperature changes (the north bedroom being typical), and other answers to the researchers' question . . .

How Well Do Perimeter Systems Heat a Slab Floor Home?

By S. Konzo
University of Illinois

THE RESULTS OBTAINED with the four-feeder arrangement of the perimeter-loop system, as described in the previous article, indicated that the feeders should be extended into the exposed corners. These earlier studies in Research Residence No. 3 were made with 8-in. diameter feeder and perimeter ducts. Since the total loss in pressure for the duct system was considerably lower than the available pressure of the furnace-blower unit, the conclusion was reached that the size of the ducts could be reduced. Therefore, in the summer of 1951, the slab floor in the Residence was removed for the second time, to permit the installation of a 6-in. diameter perimeter-loop system.

Furthermore, since the research advisory committee of the National Warm Air Heating and Air Conditioning Association was interested in means of reducing the cost of the distribution system, provision was also made for a radial system. The latter system is one in which the warm air from the counterflow furnace is collected in the subfloor plenum, and conducted through radial feeders leading directly to the registers located near the exposed walls of the house. In other words, the main difference between the loop system and the radial system is that the latter system does not provide for a perimeter duct around the exposed edges of the floor slab.

Five Series Studied

Research Residence No. 3, which has been described in previous articles, was a one-story, frame, basementless house of low cost construction. The design heat loss for the Residence for an outdoor temperature of −10 F was 51,600 Btu per hr, including the floor loss. Since the floor area was only 768 sq ft, this amounted to a design heat loss of 67 Btu per hr per sq ft of floor area, which is indicative of the fact that the house was not weatherproofed to any great extent.

In Fig. 1 are shown four floor plans, illustrating the five different arrangements studied. Those diagrams labelled as Series P show the three arrangements of the loop system that were studied, while that labelled as Series R shows the two arrangements of the radial system. Seven 6-in. diameter feeders were installed in the floor slab. The feeders could be blocked at both ends so that any combination of the seven feeders could be studied. The top of the feeders was 6 in. below the floor surface at the subfloor plenum and sloped upward to the junction with the perimeter duct, at which point the ducts were 2 in. below the floor surface. When the radial system was in use, the perimeter loop was sealed on both sides of the floor registers, and also at the junction point where unused feeders connected with the perimeter loop.

Five different arrangements were studied:

Series P-21: Loop system, five feeders, 4 x 14 in. floor registers
Series P-22: Loop system, four feeders, 4 x 14 in. floor registers
Series P-23: Loop system, five feeders, 2¼ x 14 in. floor registers
Series R-1: Radial system, six feeders, 4 x 14 in. floor registers
Series R-2: Radial system, six feeders, 2¼ x 14 in. floor registers

The 4 x 14 in. floor registers used in three of the series of studies were of the non-deflecting type in which the air issuing from the register was projected vertically upwards. The 2¼ x 14 in. registers were of the deflecting type, especially developed for these new applications, in which the air was not only discharged upwards from the floor, but also was deflected in a fanwise stream to blanket the window or cool wall surfaces.

The loop system with four feeders was found to give unsatisfactory results, since the bedroom temperatures could not be maintained at a desired level even after considerable dampering of the registers in the other rooms. Hence, in this discussion, no further mention will be made of Series P-22.

The operating conditions for the four remaining series, essentially the same as those for the previous season during which the 8-in. diam-

How We Got Where We Are In

WARM AIR PERIMETER HEATING

the *10th* in a series planned to tell about:

- **Investigations in the Research Residences at the University of Illinois**
- **Design and installation data (condensed from manuals published by the National Warm Air Heating and Air Conditioning Association)**
- **Specific phases of warm air heating**

. . . in articles so far:

- **heating basementless homes**
- **warm air ceiling panels**
- **heating slab floor homes with ceiling and floor panel systems**
- **floor panel-convection heating for slab floor homes — partially open and completely open**
- **survey of field practices**
- **new research residence built**
- **comparison of two loop perimeter and three convection systems**
- **comparison of perimeter-loop and two-loop system**
- **loop vs. radial system**

. . . in articles to come:

- **perimeter laboratory studies**
- **crawl space heating**

eter loop system was under investigation, were as follows:

Setting of room thermostat at 72 F

Differential setting of room thermostat at minimum value to provide frequent but short burner operations

Furnace of counterflow type and gas-fired

Blower speed adjusted to provide 100 F temperature rise of air through the furnace. Blower set to operate continuously

Little Temperature Variation

One index of plant performance is the normal variation in living zone temperature during the cyclical operation of the burner. As might be expected from the fact that the same furnace, thermostat, and fan switch settings were used in all cases, no difference between the series was noted. For all four series, the room-air temperature variation was negligible, amounting to less than 0.5 F. This was the same order of magnitude as the variations experienced with the 8-in. diameter loop system in the same Residence.

The response of the system to sudden changes in outdoor temperature was also considered to be most satisfactory. No evidence existed of lag or over-run of room-air temperatures during periods when the outdoor temperatures changed rapidly. The flywheel effect of the partially heated floor slab can be considered to be an important factor in providing practically constant air temperatures in the living zone.

How Temperature was Balanced

Another index of plant performance is the temperature balance maintained between different key rooms in the house. The following results were obtained after each system was balanced as well as could be accomplished, and then allowed to operate without further changes:

Loop system: temperature difference between living room and two bedrooms was consistently less than 1.0 F

Radial System: temperatures in the bedrooms were generally 1.0 F to 2.0 F lower than those in the living room

The temperature difference between the warmest and coolest areas of the living room was less than 2.0 F for all four series. With the loop system the air temperatures in the corners of the room were slightly higher than when the radial systems were in use. Also the air temperatures were higher in the corners when the deflecting registers were used in place of the larger non-deflecting registers. These results confirmed the conclusion arrived at previously that the feeder ducts should be extended into the exposed corners of the slab floor. The results also indicated that in this study the special deflecting registers provided better distribution of air than did the non-deflecting floor registers.

Vertical Differentials Small

From the standpoint of comfort, it is highly desirable to have uniform air temperatures existing between the floor and the breathing level. The temperature gradients for the north bedroom were representative of those experienced in the other rooms of the Residence, and are shown in Fig. 2. A vertical gradient indicates a constant temperature between floor and breathing level, whereas a sloping gradient indicates that a temperature difference exists. The following comments can be made from the evidence shown in Fig. 2:

a) The loop system (Series P-21) provided a more uniform temperature than did the radial system (Series R-1). The warmer floors experienced with the loop system gave a greater panel heating effect, and a lesser heat input through the registers. The lower register-air temperatures for the loop system resulted in a lower ceiling air temperature.

b) The floor surface temperature was higher for the radial system than for the loop system in this bedroom, because the measuring station was closer to the feeder used for the room.

c) The deflecting type registers resulted in better room temperature conditions than did the non-deflecting registers. Compare the right-hand curves in Fig. 2. The explanation offered is that the deflecting vanes in the register caused better mixing of register air and room air, which in turn resulted in a more uniform air temperature from ceiling to floor.

The curves in the left side of Fig. 2 were for an outdoor temperature of about 10 F, whereas those on the right side were for temperatures of about 25 F. It should be understood that the slope of the gradient curves will change with the weather. Usually the curves approach a vertical position with mild weather operation and tend to slope more for colder weather operation. In other words, as the outdoor temperature decreases, the floors tend to become colder and the ceiling warmer.

The effect of outdoor temperature on the room-air temperature differentials in the same bedroom is shown in Fig. 3 for the loop and radial systems. The upper curve for the loop system indicates that colder weather did not change the temperatures much at the ceiling, breathing, sitting and floor testing levels. The lower curve for the radial system shows that the weather effects were more pronounced. In general, as shown by the table in Fig. 3, the floor to ceiling differentials were more satisfactory when the deflecting type registers were used.

Special Registers for Bathroom

A special study of registers was made in the bathroom. Experience with previous installations had shown that uniformity of room-air temperature was most difficult to obtain in small rooms with relatively large exposures, such as in a bathroom. Given below are three arrangements studied and their corresponding temperature differentials between breathing level and floor for an outdoor temperature of 35 F.

2¼ x 14 in. floor register, deflecting type	3.9 F
4 x 14 in. floor register, non-deflecting	4.4 F
Special register below bathtub	1.5 F

The smallest differential was obtained with the arrangement in which the air from the perimeter loop was admitted underneath the bathtub, and was then discharged into the rooms through a long narrow grille located at the base of the tub.

The discussion up to this point indicates that the loop system provided slightly better room air temperature conditions than did the radial system, but not of significantly large magnitude. The comfort performances of both systems were better than the performance of the conventional overhead duct system.

[Parts of this article are condensed from a report entitled, *Performance of Warm-Air Perimeter-Loop and Perimeter-Radial Systems in a Residence*, by H. T. Gilkey, R. W. Roose, and M. E. Childs, ASHVE Journal Section, *Heating, Piping and Air Conditioning*, October 1953.]

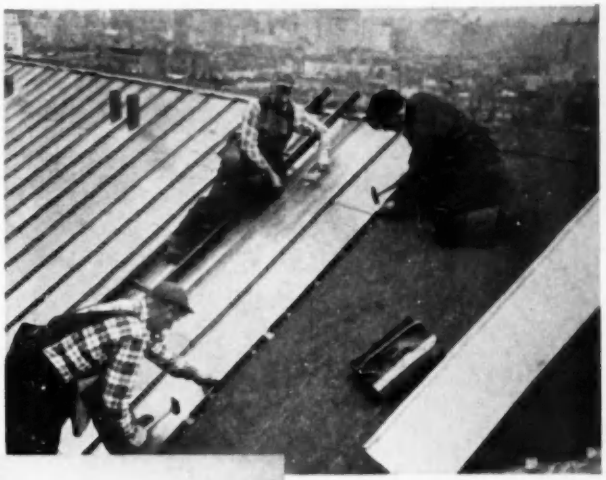
ANOTHER CASE OF

Copper

WHERE IT COUNTS

THE MURRY AND LEONIE GUGGENHEIM DENTAL CLINIC, N.Y.C.

Architects: YORK & SAWYER. Gen. Cont.: CAULDWELL-WINDGATE, both of New York City. Sheet Metal Cont.: SOBEL & KRAUS, Bronx, N. Y. Dist.: SERVICE METAL & ROOFING SUPPLY CORP., Bklyn., N. Y.



(Above) **PREFABRICATED PANS** of 16 oz. Revere Copper are being put into place and cleated down, using two nails per cleat; a sign of good workmanship and the assurance of a trouble-free job. Pans are 17¼" wide by 8' long and attached top and bottom with loose lock cross seams.

(Above) **FATHER AND SON TEAM** of George and Ted Johansmeyer give the last minute touches to a valley strip section and vent pipe respectively while Gus "Angle Iron Gus" Almquist prepares still another vent pipe for installation. All sections were prefabricated in the shop. As a result, considerable time and trouble were saved on the job.

(Below) **NOTE EXPANSION JOINTS** every 32 feet in the gutter. Continuous research by Revere Laboratory Technicians has proven conclusively that properly spaced expansion joints in relation to the weight of copper used are vital installation factors in producing a trouble-free job. For full details send for a copy of Revere's famous booklet, "COPPER AND COMMON SENSE."

(At right) **10,000 LBS.** of Revere Sheet Copper were used for the standing seam roof, valleys, gutters and base flashing. Non-rusting, enduring copper replaced a deteriorated, non-metallic roof. The metal proven through the centuries, copper, will endure for many, many years.

(Below) **ROOFERS TELL US** they prefer copper to any other metal with which to work. Being ductile it is readily cut and worked into any form. It solders like nobody's business and once installed they can forget it. No other metal or alloy has all the desirable construction characteristics of copper.

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Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N.Y. Sales Offices in Principal Cities, Distributors Everywhere.

SEE REVERE'S "MEET THE PRESS" ON NBC TELEVISION, SUNDAYS

Fred Hotop, left, discussing Zone Control with Honeywell sales engineer Mac Duncan.

"I'll go down the line for Honeywell Zone Control"

says Fred Hotop, engineer, Edward J. White, Inc., South Bend, Ind.

"In our shop we've built the tradition that a White heating job is a job done right.

"To build a reputation of providing the finest quality heating installations, you've got to do three things well: plan the job, pick the equipment, make the installation. A weak spot anywhere in here can do lots of harm. That's why the equipment you choose is so important.

"Having proved Honeywell Zone Control equipment on so many jobs, I can say I'll go down the line for Honeywell Zone Control.

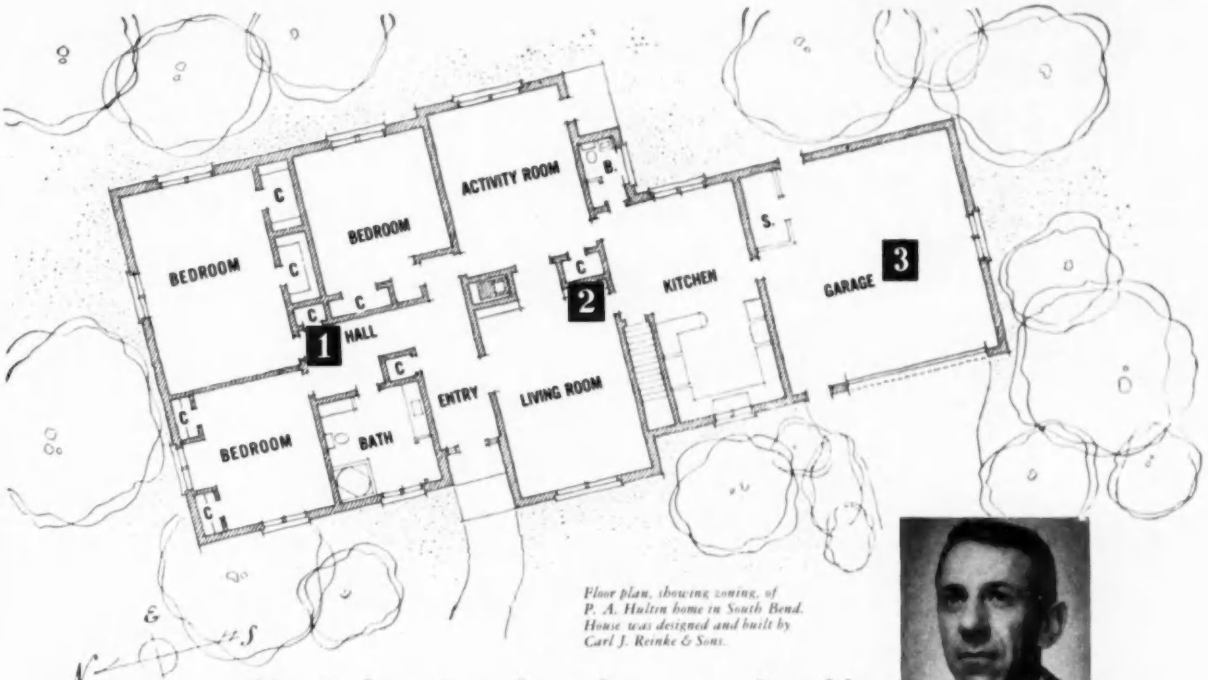
"Zone Control is the perfect heating system. It alone provides the answer for people who want real comfort everywhere in their home.

"Besides, no home heating problem is too difficult for the dealer who really *knows* Zone Control.

"With it you can handle almost every heating situation, regardless of construction, or conditions such as wind, sun, exposure, glass, or zero weather."

H HONEYWELL

Another Plus-Profit Idea from Honeywell



Floor plan, showing zoning, of P. A. Hultin home in South Bend. House was designed and built by Carl J. Reinke & Sons.

"Here's how I make a home comfortable throughout—with Honeywell Zone Control"

Comfortable throughout—that's the end result, with Honeywell Zone Control. And here are the details of the story in Fred Hotop's own words. His zoning comments refer to the floor plan above.

"The Hultins were impressed—and pleased—when we went over the zoning plan.

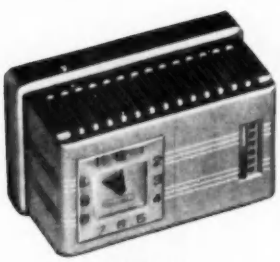
"I explained how the thermostat for *Zone 1* would enable them to compensate for cold north winds. And how it could be used to set back the temperature and save fuel when the bedrooms weren't in use.

"Then I showed them how a separate thermostat in *Zone 2* would keep the living area from overheating on sunny winter days, yet give them comfortable, even warmth.

"The thermostat controlling *Zone 3* maintains the garage area at about 60 degrees—warm enough for a garage, yet easy on fuel.

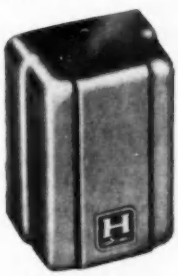
"That's just about the zoning story as I told it and sold it to the Hultins."

Fred Hotop explains other features of the job, concerning the Chronotherm and Outdoor Weathercaster below.



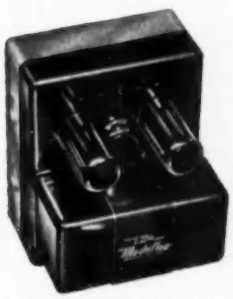
CHRONOTHERM

"I put a Chronotherm in charge of Zone 2, the living area. It provided the Hultins with the automatic night set-back and morning temperature pick-up they wanted."



WEATHERCASTER

"I installed a Weathercaster outside the house to anticipate changes in the heating load of the entire house. The Weathercaster is an ideal device for use with Zone Control."



ELECTRONIC RELAY AMPLIFIER

"This component is the 'brain' of the set-up. It receives signals from the Weathercaster and the indoor thermostats, correlates them and then calls for more or less heat."

Illustrated above are some of the controls Fred Hotop used on the Hultin home — along with his reasons for choosing them. For more complete details on Honeywell Zone Control, call your nearest Honeywell office. Or write Honeywell, Dept. AA-10-70, Minneapolis 8, Minnesota.

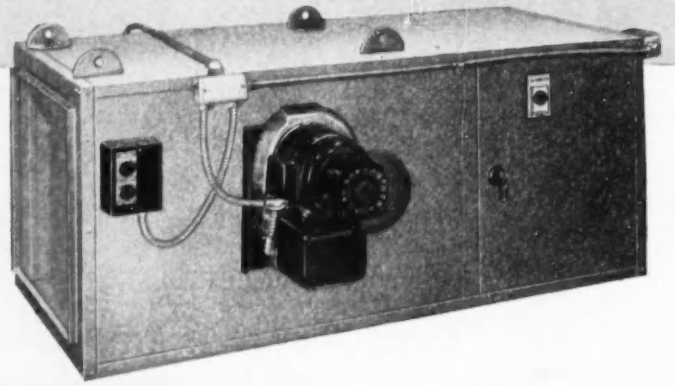
MINNEAPOLIS **Honeywell**

H HONEYWELL

First in Controls

Now Ready a high efficiency, fully automatic

OIL FIRED HORIZONTAL WINTER AIR CONDITIONER by SUNBEAM AIR CONDITIONER DIVISION of AMERICAN-Standard



The OLANDO ...gives you a larger share of today's big residential market!

HERE'S a real space-saver for small and medium size homes. Designed especially for oil firing, this steel horizontal heating unit can be safely installed in the attic, closet, utility room, in crawl space under the floor, or other out-of-the-way locations. It also is ideal for zone heating in larger homes where more than one winter air conditioner can be used to advantage.

Extremely versatile, the Olando is adaptable to virtually unlimited applications . . . for perimeter or conventional duct system installations in both new construction and modernization jobs. It is also ideal for suspended applications in garages and service stations.

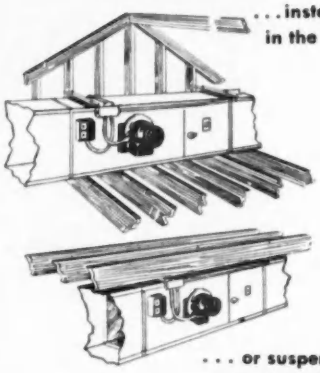
Available in three sizes—80,000, 100,000, and 112,000 Btu per hour at bonnet—this new horizontal unit is factory assembled and shipped with wiring harness for quick and easy installation. For more detailed information, including rating and dimensions, contact your wholesale distributor. **Sunbeam Air Conditioner Division,** American Radiator & Standard Sanitary Corporation, Bessemer Building, Pittsburgh 22, Pa.

QUALITY-BUILT PRECISION ENGINEERED

Inside of durable metal jacket is protected by corrosion resistant, reflective coating. Heavy steel heating element fired by famous Arcoflame Oil Burner assures better heating and longer life. Detroit Controls provide trouble-free automatic operation.

Factory Assembled

for quick, easy installation



. . . installed in the attic

. . . or suspended under the floor

AMERICAN-Standard
SUNBEAM AIR CONDITIONER DIVISION
ELYRIA, OHIO
Executive Offices: Bessemer Building, Pittsburgh 22, Pa.

Serving home and industry

AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS & WALL TILE • DETROIT CONTROLS • KEWANEE BOILERS • ROSS EXCHANGERS • SUNBEAM AIR CONDITIONERS

Sell the Wall Furnace ...that's Easiest to Sell

THE BURNER MAKES THE DIFFERENCE!

CENTRAL HEATING AT SPACE HEATER COST

The MONOGRAM Oil Furnace is the answer to low-cost heating in small homes. The patented "Forced Air" Vaporizing Burner gives more BTU's per gallon of oil, hence is more economical, yet dual heating (see illustration) is thermostatically controlled.

MORE HEAT AT LESS COST

The famous MONOGRAM "Forced Air" Vaporizing Burner makes the difference! It's the design of the Burner, so advanced in engineering, that makes possible MORE BTU's for its size, delivering a wider range of operation, working just as efficient in cold as in mild weather!

Monogram OIL WALL FURNACE

NO COSTLY DUCT WORK OR FLOOR SPACE REQUIRED

The MONOGRAM Oil Wall Furnace is widely adaptable ...fits into the wall (projects but 3½ in. into the room) and provides DUAL heating. Can be installed in ONE day! Heated air is forced out at eye level. Furniture, even, may be placed in front of this unit. Saves space, saves owner in many ways.

SPECIFICATIONS

BTU rating . . . 65,000
Height from Floor of Front of Cabinet . . . 74½ in.
Height from Floor of Back of Cabinet . . . 72 in.
Width of Front . . . 32 in.

IDEAL FOR SMALL HOMES . . .

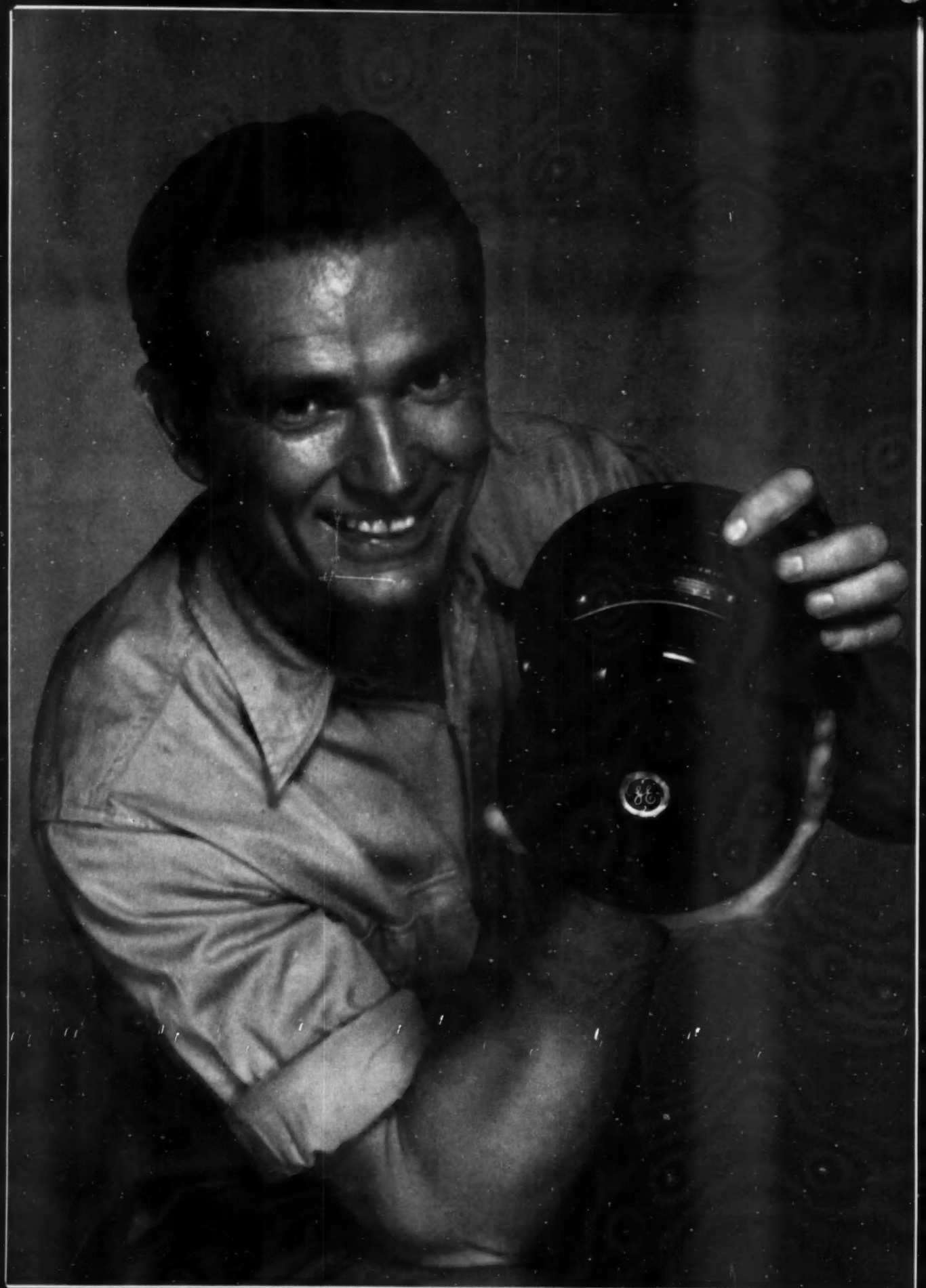
Any 4 or 5 room house may be heated comfortably with a MONOGRAM Oil Wall Furnace! Fully automatic, the heat is thermostatically controlled night and day. Thumb-nail sketch shows how dual registers provide multi-room heating.

SEND COUPON TODAY!

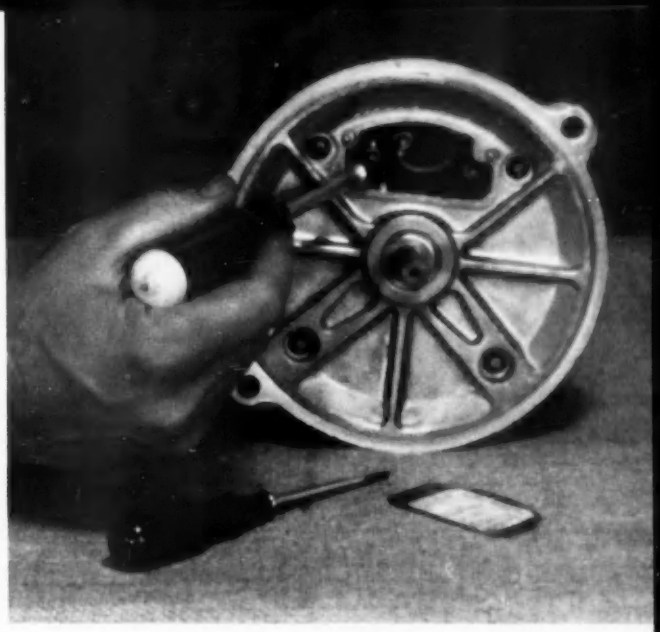
We are interested. Send complete facts and figures on MONOGRAM Oil Wall Furnaces.

NAME .....
COMPANY .....
ADDRESS ..... ZONE ..... STATE .....
CITY .....

Monogram IN THE WALL *Furnace*
MADE BY
THE **QUINCY STOVE** MANUFACTURING CO.
825 SOUTH FRONT STREET
QUINCY . . . ILLINOIS



LIGHTER—SMALLER. New motor more than 50% lighter than older model. Weighs only *11* pounds! Retains same (NEMA N) flange mounting. Easier to handle, easier to install, motor's black enamel satin finish blends well with other oil-burner components.



ROTATION EASILY REVERSED. Simple interchanging of leads on easy-to-get-at terminal board gives clockwise or counter-clockwise shaft rotation . . . cuts service stocks in half!

REVOLUTIONARY NEW G-E OIL BURNER MOTOR

Here is the all-new, lightweight G-E oil-burner motor. Scores of thousands like it will be giving more dependable heating to your customers this winter. And while delivering *full-rated* power, the new motor needs less installation space . . . saves on your transportation and handling costs.

Look at these outstanding features: new insulation is ideal for basement atmosphere . . . appearance is strikingly modern . . . lubrication life is longer than ever . . . manual-reset thermal protector button is more conveniently located . . . instruction nameplate is easier to read.

And the new G-E motor is an ideal replacement for "tired" motors . . . more dependable operation will mean less servicing. In addition to having the same flange mounting, its easily reversible shaft rotation can serve to cut your service stocks in half!

Add up everything you and your customers want in an oil-burner motor, and rely on General Electric's 75 years of electrical experience to deliver it.

Contact your nearest authorized G-E distributor or Apparatus Sales Office today for complete information on the all-new G-E oil burner motor, or write Section 702-2 for bulletin GEC-975. General Electric Co., Schenectady 5, N. Y.

1879 75 1954 YEARS OF ELECTRICAL PROGRESS

You can put your confidence in—

GENERAL ELECTRIC

TWO NEW CRESCENT SCREWDRIVERS FEATURE TENITE HANDLES

K1300 and K1500 series

K1700 series

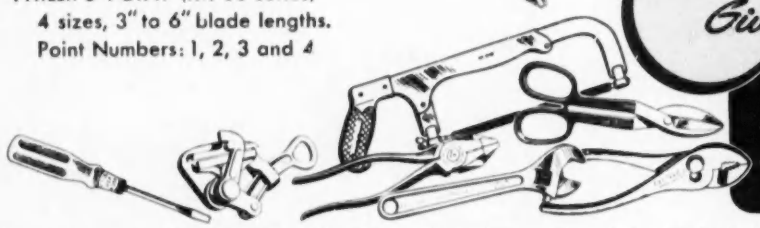
● Here's typical Crescent quality in a new line of plastic handled screwdrivers! Blades are hot forged and hardened full length. Then blade and handle are assembled under pressure so blade will never loosen. Finally, each screwdriver is individually tested to insure blade tips that will not break or twist.

You'll recognize these new Crescent Screwdrivers by their distinctive blue-colored Tenite handles, with soft-edged knurling that assures a sure grip without blistering the hand. Two patterns for slotted screws . . . one for Phillips head screws . . . in the sizes listed below.

STANDARD PATTERN (K1300 series)
5 sizes, 3" to 10" blade lengths.

CABINET PATTERN (K1500 series)
4 sizes, 3½" to 8½" blade lengths.

PHILLIPS POINT (K1700 series)
4 sizes, 3" to 6" blade lengths.
Point Numbers: 1, 2, 3 and 4



CRESCENT TOOLS
Give Wings to Work
®
Sign of the Artisan
Symbol of Excellence

Crescent is our trade-mark, registered in the United States and abroad, for wrenches and other tools. Sold by leading distributors and retailers everywhere and made only by

CRESCENT TOOL COMPANY, JAMESTOWN, NEW YORK

Oral Guarantee to Pay May Be Void

By Albert W. Gray

If a dealer is completing work for a second party on the basis of verbal guarantees of payment made by a third, he may not be able to collect his fees. However, if the verbal promise specifically promotes some interest of the third party, it is binding

A WARM AIR heating dealer depended for payment on the oral promise of an owner, "I'll see you get your money," and completed the installation of furnaces under an agreement with the general contractor who had failed to pay. The supreme court of the state denied the right of the heating dealer to recover on this oral promise.

The contract was for the construction of four duplex houses, and the general contractor had subcontracted the furnishing and installation of eight warm air heating units for $1992 each, representing $1400 for the equipment and $592 for the installation services.

The heating dealer had installed a portion of the ductwork and had billed the general contractor for an amount covering the cost of the delivered furnaces and that part of the installation work already performed. The general contractor had failed to pay and the heating dealer then stopped the installation work.

After a few weeks the owner telephoned that she wanted these furnaces installed in order properly to prepare the apartments for renting. The heating dealer told her nothing further would be done until payment was made. She then made the oral promise, stating in full:

"You don't have to worry. I'll see you get your money. We have to have heat. The plasterers need it and the painters need it and I am supposed to have this work done so people can move in."

Two days later the heating dealer resumed the installation work. Later he was compelled to sue the owner to recover on her promise, "I'll see you get your money," and the trial ended in a judgment against this owner and in favor of the heating dealer for $1992. The owner appealed.

Guarantor Not Liable

A statute of that state, known as the *Statute of Frauds*, which is substantially the same in every state, provides:

"In the following cases every agreement shall be void unless such agreement, or some note or memorandum thereof, be in writing and subscribed by the party to be charged therewith: every special promise to answer for the debt, default or misdoings of another person."

The owner contended on this appeal that her promise to this heating dealer was unenforceable and void under the provisions of this statute, as it was to answer for the debt of the general contractor and to be enforceable, must have been in writing.

The supreme court of that state, in reversing the judgment of the lower court and deciding against the recovery by this heating dealer, said:

"Where goods, money or services are furnished to a third person at the request and on the credit of a person thus promising to pay, the agreement to pay is original and the party making the promise will be liable although the promise is not in writing. However, where goods are furnished to a third party (the general contractor, in this case) at the request of the party making the promise (the owner) and with reliance on his credit, and the transaction is such that the third party or beneficiary is liable therefor to the person to whom the promise is given as an original agreement on his part, the liability of the person making the promise is clearly only as guarantor, and unless in writing, is void."

Two People Not Liable for Debt of One

A situation of this character had been before this same court several years before in which a bank had assured a lumber firm that if it would deliver the building material which it had contracted to furnish an owner in the construction of houses on which this bank held a mortgage, that the lumber firm, "Would be paid for the lumber and building materials furnished by it and the bank would keep check on the amount of lumber and materials furnished and always see to it that the lumber company would be paid from the money the bank was loaning to this owner."

(Please turn to page 108)

Albert W. Gray, author of this article, has had twenty years experience as an attorney in the courts of New York City. He has written widely on legal matters and is the author of "The Family Legal Adviser".

1 A WELL-LOCATED BUILDING . . .

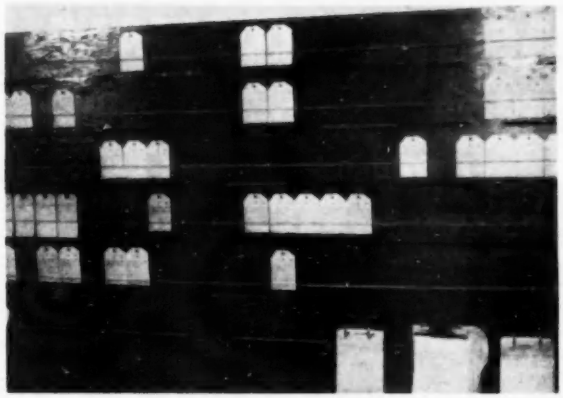
2 AND A CAREFULLY thought out interior layout are part of one warm air dealer's . . .

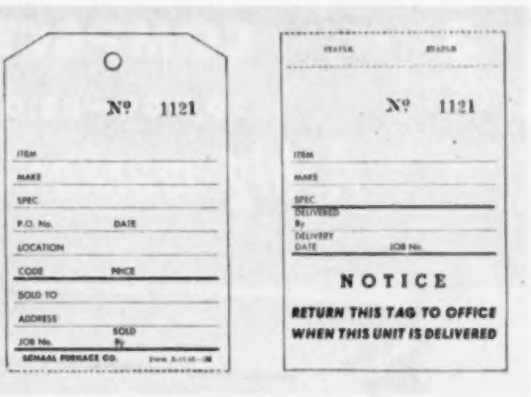
Double-Barreled Plan For a Successful Shop

— is aimed at

- top working efficiency
- an organized public relations program

By Donald C. Taylor





3 THE STAFF keeps track of all materials through devices such as this materials ticket board in the office *(left)*, for which there is a corresponding board in the shop. When units are received, the top and bottom halves of the tags *(right)* are separated, one being placed on the unit in the warehouse, the other on the office board

CAREFUL PLANNING — for shop efficiency and good public relations — has been the key to progress for The Schaal Furnace Co. of Des Moines.

Shop and office efficiency has been insured by a well thought out physical plant. The company building itself is located at about the center of the city, so that a call to any main residential area can be serviced very rapidly.

For display of heating units, the modern, open front of the Schaal building contains abundant space. Further back, there are successive partitions. At left front, behind a counter, is a clerk-receptionist's desk. At right, just back of the display room, is the sales manager's office. Beyond the receptionist is the bookkeeping department, and back of that is the office of the owner, D. P. Schaal.

The shop extends back of the offices. In the shop is an office for the shop foreman, the installation foreman, and the dispatcher. This is useful, Mr. Schaal says, as it saves materials and time. The dispatcher, who is there continuously, prevents any service man from coming in and gathering up parts indiscriminately to use on a current job. It minimizes stock losses which result from careless handling.

Back of the shop office is a double stock room. Behind that is a large unheated stock room for large sections of duct, elbows, etc. A recent addition, this section doubles the original storage area. It had been found that sections of duct of varying sizes were accumulating in one stack. "With the large space we have now for this stock," says Mr. Schaal, "space can be divided off into a section for every size. We feel we are in a good position to hold stock efficiently during winter months, and, move it out quickly as rush demand is made for it."

Equipment Handled Carefully

A main aisle down through the center of the shop is taped out with a wide yellow stripe. That holds the aisle clear and open. A piece of equipment left strewn in the aisle can be very hazardous, the company feels.

A variety of trucks and carts is used to aid in carrying pieces of heavy sheet metal, sections of pipe, and equipment of all sizes handily around the shop. A long low flat truck takes the metal sheets. For large equipment, the company uses carriers with wooden "fence" sides, open at the loading end, and rubber wheeled at the back. A dolly may be placed at front. For small but heavy equipment and also for holding scraps, there are boxes approximately half the size of an old fashioned wood box. These move about on 2 in. rubber rollers. These small carts are painted bright yellow for easy (and safe) visibility.

A Many-Sided Public Relations Program

Workmen, salesmen, Mr. Schaal himself — all take part in the company's public relations program.

The men in the shop are instructed to keep alert for the names of key men (architects, engineers, foremen, etc.) on any job and to establish contact with one or another of them. Creating friendly working relationships on one job may mean another job in the future.

Salesmen carry picture portfolios which show the contractor and the home owner the firm's methods of installation and final inspection.

These portfolios were completed for a home show — another means by which good publicity is obtained. The company purchased its own photographic equipment and has the facilities for developing film in the building. Mr. Schaal feels that a variety of good photographs illustrating the firm's service may do a better selling job than hours of talk. The equipment is used to take pictures of special jobs, the shop, or various operations.

Stock Control Board Useful

In addition, the company has developed a method for avoiding the bad impression made by delayed deliveries. In the office adjoining that of Mr. Schaal, a plywood panel occupies much of a wall (Fig. 3, left). Another board in the shop is coordinated with it. When a purchase order is made out for a heating unit, a tag (Fig. 3, right) is filled out for it and placed on the front office

(Please turn to page 112)

3 NEW COMPACT GAS HORIZONTALS

70,000–85,000–105,000 B.T.U.

A big market is waiting for them

With these three new Armstrong gas-fired horizontal furnaces you can go right along with the modern builder's idea that size and location of space assigned to the heating plant are of minor importance. You can fit them into almost *any* space; you can deliver heat from almost *any* location.

Yes, and without sacrificing profit, without worrying about your reputation. These furnaces are efficient and long-lived. They look good. They install easily. Although they sell at attractive prices, there is no quality-cutting. They are full-quality Armstrong "Indoor Sunshine" winter air-conditioning furnaces. Completely equipped; assembled at the factory.

Ideal for crawl space, attic installation or suspended. Built for residential, commercial and industrial use. The largest size is just 49¼" long, 16¼" deep and 22¾" high.

If you were to specify design and construction for a line of gas horizontals you'd write our Specification Sheet S-35. Drop a card to us for your copy. See for yourself.

Wherever you are

YOU'RE ON THE ARMSTRONG MAP

. . . IN A STRATEGIC LOCATION

Armstrong's two huge plants serve both sides of the continent quickly, economically. A warehousing distributor, with a complete Armstrong inventory, is within a stone's throw of everywhere. Wherever you are, Armstrong's distribution system is set up to serve you. It's better, quicker, more profitable . . . for you.

Please address Dept. AA at our plant nearest you.

ARMSTRONG
FURNACE COMPANY

COLUMBUS, OHIO — **DES MOINES, IOWA**

Warm-Air Furnaces—Gas, Oil, Coal—A Complete Line

PUT AIR WHERE IT IS MOST NEEDED

TITUS PERIMETER Diffusers

NEW STANDARD OF PERFORMANCE THAT TAKES AIR DISTRIBUTION OUT OF THE PAST

Make no mistake about it . . . *the special patented baffles* . . . make all the difference in the world in the air distribution performance of *TITUS DIFFUSERS.* These baffles direct the air stream over the entire wall from floor to ceiling. Give 180° diffusion. This near perfect performance eliminates drafts. Makes house warmer because outside walls are warmer.

OLD-FASHIONED-TYPE REGISTERS SIMPLY CAN'T COMPARE

They do not have the adequate control surfaces — properly placed — to correctly distribute cooled or heated air.

COMPLETELY NEW BEAUTY

No longer is it necessary to disfigure lovely walls with old-style registers. Titus diffusers install in the baseboard and recess to be unobtrusive. Streamlined appearance blends with room. Smooth contours permit drapes to slide easily past diffuser without catching or snagging.

REQUIRES ONE-HALF THE LABOR, ONE-HALF THE DUCT WORK OF ORDINARY INSTALLATIONS. No roughing-in necessary. Makes amazing savings on every job.

ORDER A SAMPLE TITUS GRILLE TODAY DIRECT OR FROM YOUR JOBBER.

GIVE YOURSELF A SHOWDOWN DEMONSTRATION . . . PROVE ONCE AND FOR ALL ITS *OUTSTANDING BEAUTY . . . STRONGER CONSTRUCTION . . . GREATER DIFFUSION EFFICIENCY* . . . ABSOLUTELY HAVE NO EQUAL.

FREE NEW 1953 CATALOG

MAIL TODAY

TITUS, INC., WATERLOO, IOWA

Please rush me the following:

- ☐ Booklet of Trends in Warm Air Heating
- ☐ Complete New 1953 Catalog, including Engineering Data
- ☐ Information on New Quick Sales Display Promotion Kit
- ☐ New Consumer Circular

NAME_____

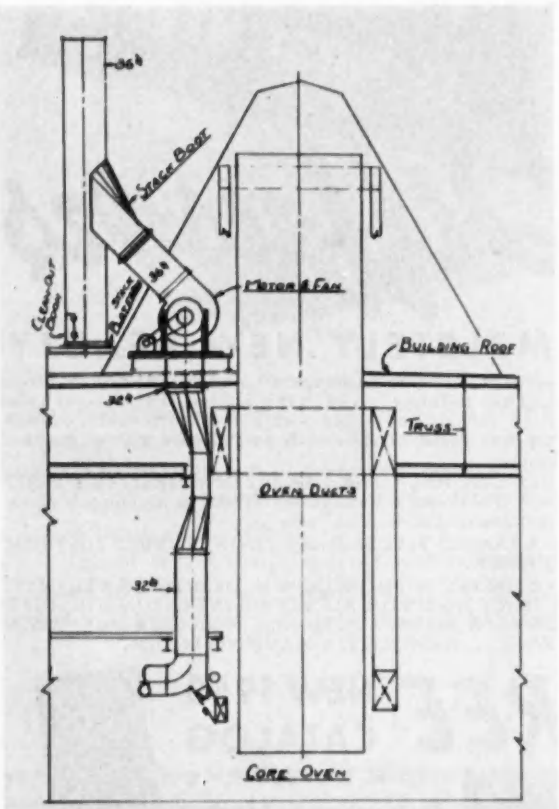
ADDRESS_____

CITY_____ STATE_____

Making a Fan-to-Exhaust Stack Boot Fitting

In many exhaust systems, the stack is isolated from the fan so that the fan may be removed for repair without disturbing the ductwork. The fitting described connects the fan discharge to the stack

By Hugh B. Reid
Instructor, Sheet Metal Pattern Drawing



1 THE BOOT FITTING described connects the blower discharge of exhaust systems to the stack, in installations of the type depicted

AN EXHAUST SYSTEM from a foundry core oven (Fig. 1), in which the fumes are drawn through a fan into a stack and exhausted out into the atmosphere, illustrates a practical application of the pattern development problem.

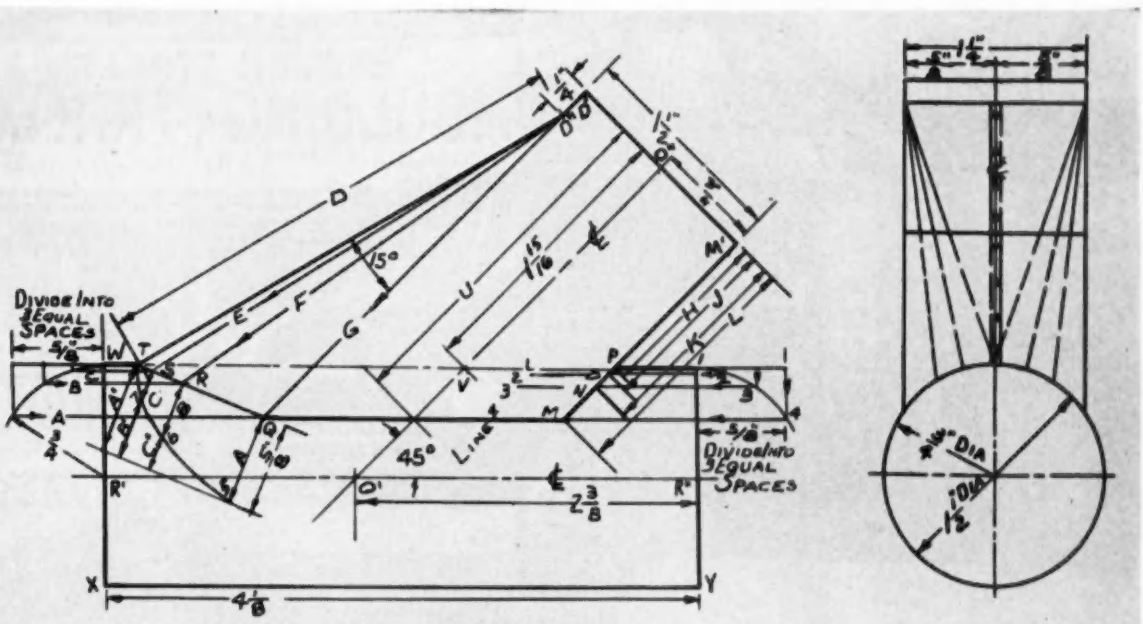
In an installation of this type, it would be necessary to specify that the stack be supported by the roof beams and not connected directly to the exhaust outlet of the fan. The stack should be provided with a cleanout door at the bottom for proper maintenance and should extend to an elevation above the building roof to assure adequate draft for the dissipation of the gases.

Note that the exhaust stack is isolated from the fan. This permits the removal of the fan for repairs without disturbing the ductwork. No rain cap is necessary on this installation, as the stack is situated on the building roof and any water entering the stack will drain through to the roof and on into the roof drains.

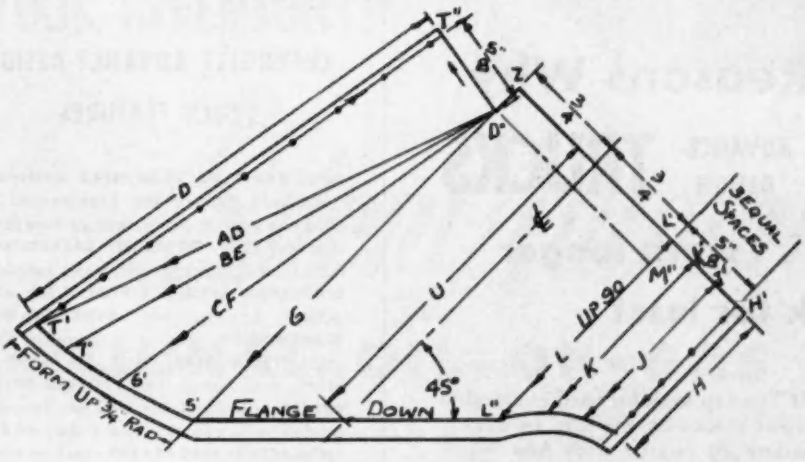
A structural steel plate base will be required to support the stack. This base plate must be securely anchored to the building framework. The plate and channel weights and sizes will be determined by the weight of the stack and the wind pressure design recommendations for the specific location. Suitable guy wire supports will be provided at or near the top of the stack. It will be noted from Fig. 1 that the duct into the suction end of the fan is 32 in. in diameter and the duct from the exhaust end of the fan is 36 in. in diameter. Any increase in the stack diameter will add to the efficiency of the system by reducing the air velocity in the stack. This will cut down the static pressure, thus conserving electrical power. Another important reason for lowering the stack velocity is that more dust particles will tend to drop out of the air stream to the bottom of the stack where they can be removed through the cleanout door. This feature is especially important when the factory is located in or close to a residential area. Dust contamination is a public health hazard which can be avoided by use of the engineering data now available.

As a practical example in velocity, assume that the design conditions for a certain exhaust problem require 14,000 cfm at a velocity of 2500 fpm. By applying the

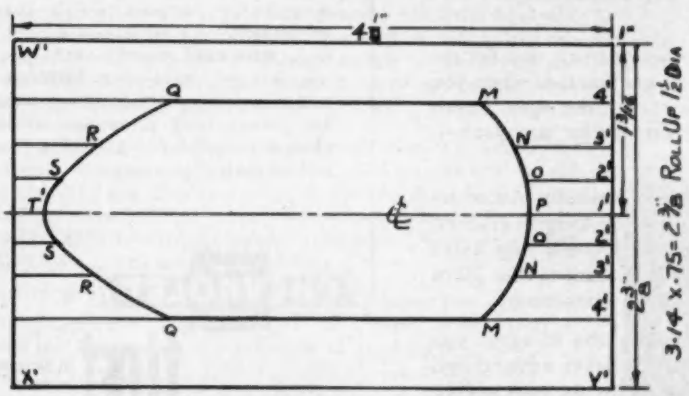
(*Please turn to page* 111)



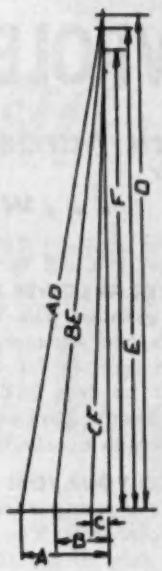
2 LINES DEVELOPED in this simplified method for the front view (shown here with the end view, *right*) are used . . .



3 IN FORMING the half pattern (one right and one left pattern being required) and . . .



4 The OPENING for the stack connection



TRUE LENGTH LINES provide arc radii for Fig. 3

4 Powerful Reasons Why CHEVROLET ADVANCE-DESIGN TRUCKS

work harder . . . work longer . . . work for less!

MORE POWER AT LOWER COST! You can look forward to sizeable savings on gasoline with Chevrolet trucks on the job. In heavy-duty models, the advanced Loadmaster engine with new high-compression ratio of 7.1 to 1 delivers more power than ever—and does it on less fuel! In light- and medium-duty models, Chevrolet's Thriftmaster engine combines top-notch performance, with rock-bottom operating cost.

TAILORED TO YOUR JOB! Of course you want a truck that fits the requirements of your particular job. And you get just that when you buy a Chevrolet truck! You get the *right* power . . . the *right* chassis units from tires to transmission. Chevrolet trucks are *factory-matched* to do your work at lowest cost!

RUGGED AND RELIABLE! These great 1953 Chevrolet Advance-Design trucks are built stronger to stay on your job longer! Frames, for example, are sturdier and more rigid. And you'll find extra strength in other vital places, too. The result is a truck that gives you extra miles and months of low-maintenance operation.

LOWEST PRICED LINE! You start saving money the moment you buy a Chevrolet truck. For, in addition to all its other advantages, Chevrolet is *America's lowest priced truck line!* Why not start saving *now!* Your Chevrolet Dealer will be happy to give you all the facts. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

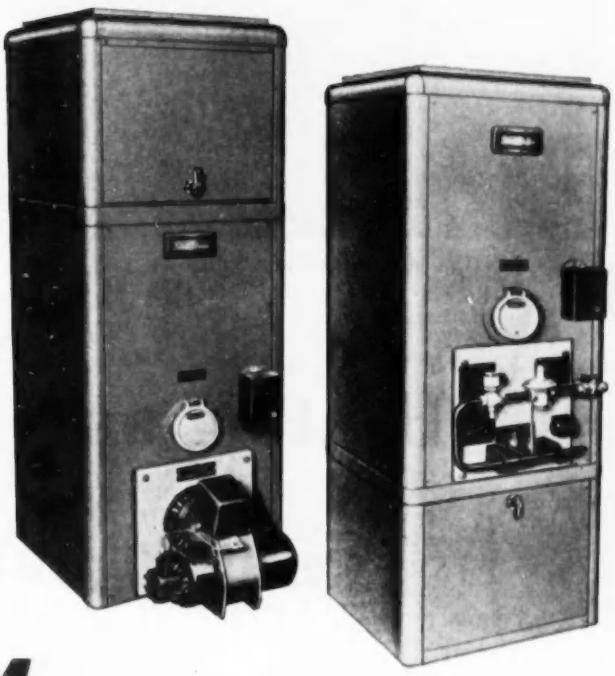
CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—the Loadmaster or the Thriftmaster—to give you greater power per gallon, lower cost per load. **POWER-JET CARBURETOR**—for smooth, quick acceleration response. **DIAPHRAGM SPRING CLUTCH**—for easy-action engagement. **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **HYPOID REAR AXLE**—for dependability and long life. **TORQUE-ACTION BRAKES**—on light-duty and medium-duty models and on front of heavy-duty models. **TWIN-ACTION REAR BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—for greater holding ability on heavy-duty models. **CAB SEAT**—with double deck springs for complete riding comfort. **VENTIPANES**—for improved cab ventilation. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—for easier handling. **UNIT-DESIGNED BODIES**—for greater load protection. **ADVANCE-DESIGN STYLING**—for increased comfort and modern appearance.

CHEVROLET
first in demand
in value
in sales

NOT MAGIC . . . JUST GOOD BUSINESS !

YOU CAN DOUBLE YOUR TWO-FUEL MARKET COVERAGE WITHOUT INCREASING YOUR INVENTORY!



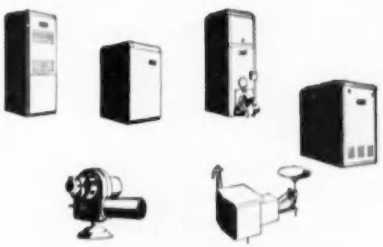
Silent Automatic

OPTIONAL OIL-OR-GAS FURNACES

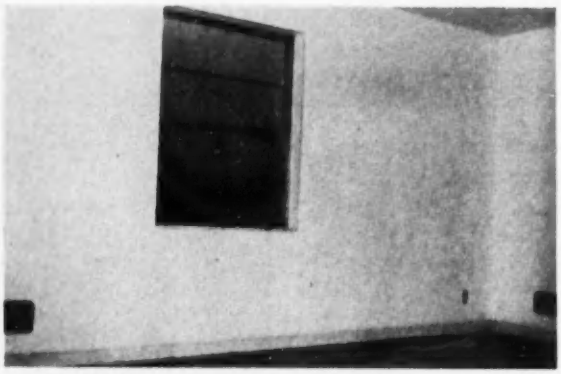
Because Silent Automatic Optional Furnaces can be fired with oil or gas, you get twice the sales value—twice the market coverage—from every furnace! That's right—you stock one furnace, install either oil or gas burner and controls when the customer decides which fuel he'll burn. What's more, these hi-furnaces can be assembled as counter-flo furnaces merely by mounting the blower section at the top. This Silent Automatic flexibility cuts down your inventory problem—saves sales!

The complete new line of Silent Automatic furnaces, boilers and conversion burners has a great deal to offer heating men on the lookout for a line they can move in volume. It's competitively priced. Its name has meant quality heating to millions for nearly 30 years. Most units come factory-assembled. There are models and sizes for every heating situation.

Write R. E. Loebell—Timken Silent Automatic Division—for information on this great new line. Do it soon! It may well be one of the finest profit opportunities of your lifetime.



Silent Automatic
HEATING EQUIPMENT
TIMKEN SILENT AUTOMATIC DIVISION
ROCKWELL SPRING AND AXLE COMPANY
Jackson, Michigan



CAREFUL placement of registers . . .

AND PROPER sealing of joints mean comfort when

Heating and Cooling with Small Round Ducts

One sheet metal man has found that a little ingenuity plus careful attention to layout equals consistently good results in home heating and cooling with small round duct systems

THERE HAS BEEN much controversy over the use of small round ducts as a means of providing adequate air for both heating and cooling a residence. However, in the opinion of Ray Fritch, sheet metal contractor of Peoria, Ill., warm air heating and sheet metal contractors need not doubt that this type of distribution system can meet the needs of a home if they give the layout the attention that every warm air heating system deserves.

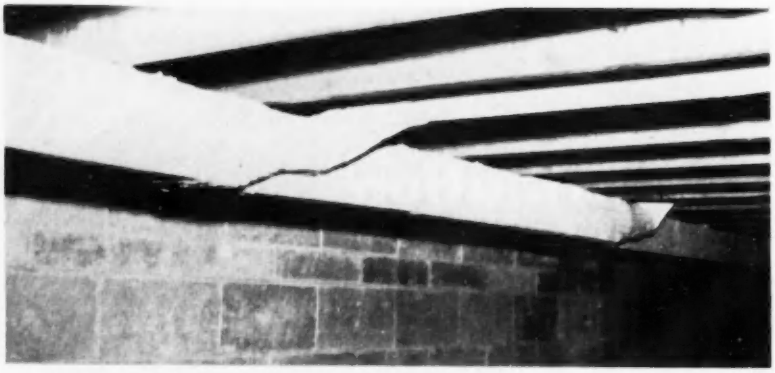
Mr. Fritch has been installing small round pipe systems since 1947, and says that he has noticed a definite saving in the cost of installing the round duct spstem. However, he finds that some of this saving is offset by the added labor required to seal the joints of the round duct, a process which is not necessary, but is considered good practice because of the increased velocity of the air as it passes through the round duct to the register.

Combines Methods for Best Results

"Every house is a separate engineering problem", says Mr. Fritch. "The dealer shouldn't try to make one type of air conditioning system fit the building. I believe in using a combination of methods that will meet the situation best." A house recently completed is an example of how Mr. Fritch applies engineering to suit the application. This six room house uses a 120,000 Btu furnace and a 3 ton cooling unit to provide year 'round comfort, and an extended rectangular plenum with small round duct for all take-off supply runs. Part of the plenum extends into the crawl space and is insulated with ½ in. corrugated air cell asbestos insulation. The take-offs from this portion of the extended plenum are also insulated.

The layout of most of the rooms adapts itself to the perimeter system of air distribution. Thus the supply runs go to the outside wall where they connect to low sidewall registers, which are not located under the window as are many perimeter wall registers. Mr. Fritch believes that outside low wall registers work best when placed to one side of the drapery material. As he explains it — when the drapes are opened, the air pattern from the register assures sufficient air across the exposed window area to counteract the cold air falling down the window, and when the drapes are closed, you not only have the additional insulating effect of the drapery but you still have free movement of the air from the register into the room.

The kitchen walls frequently are filled with cabinets of one kind or another so that it is difficult to find a good location for a supply register. The inside high wall out-



THE PLENUM extends into the crawl space. Corrugated air cell asbestos insulation (½ in.) covers the duct

THE END of the extended plenum. The 2 x 8 return duct *(arrow)* comes from the rear entrance hallway

let located above the broom closet has given good results and if possible he uses this method. However, slots beneath the cabinet doors at the floor level have proven satisfactory in many cases where the high wall register location has not been feasible.

The heating of basement rooms, especially a rumpus room, is done with ceiling diffusers, and excellent results have been obtained, Mr. Fritch says. These diffusers, he feels, are simple to install, and it is not necessary to rupture solid partition walls to bring the duct through, as the supply run to the rooms above can be sized large enough to provide the air needed in the basement rooms.

Adding the Cooling Package is Easy

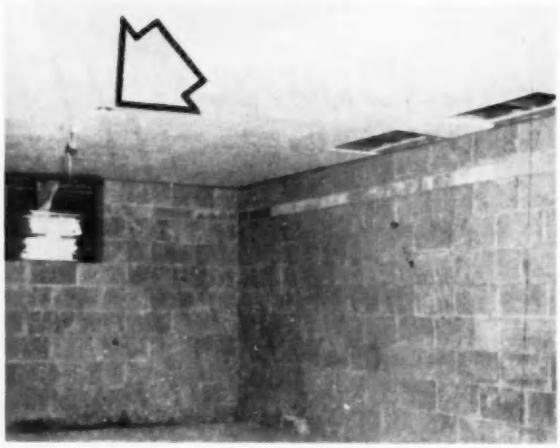
Some general contractors fail to consider the advantages of adding a cooling package to the warm air heating system, Mr. Fritch points out. The building in which the accompanying photographs were taken was one such case. However, when discussing the heating system, Mr. Fritch pointed out to the builder the added selling features of a completely air conditioned house and how little the cost would be in comparison with the other extras that are common to the better homes. "Afer that", Mr. Fritch said, "the going is easy. I have sold 15 cooling packages without advertising."

The summer cooling package is connected in the return air stream system, and if it is installed at the same time as the furnace, very little extra work is involved to adapt the duct system to accommodate the package to the furnace. The extra work is usually offset by the saving in the duct and fittings necessary to drop to the lower portions of the furnace where the intake is normally located.

All work of installing the cooling package is performed by the same mechanics who install the furnace, with the exception of the piping for the water supply and drain. The electrician who wires the furnace provides the electrical supply to the already wired cooling package.

Training Schools Important

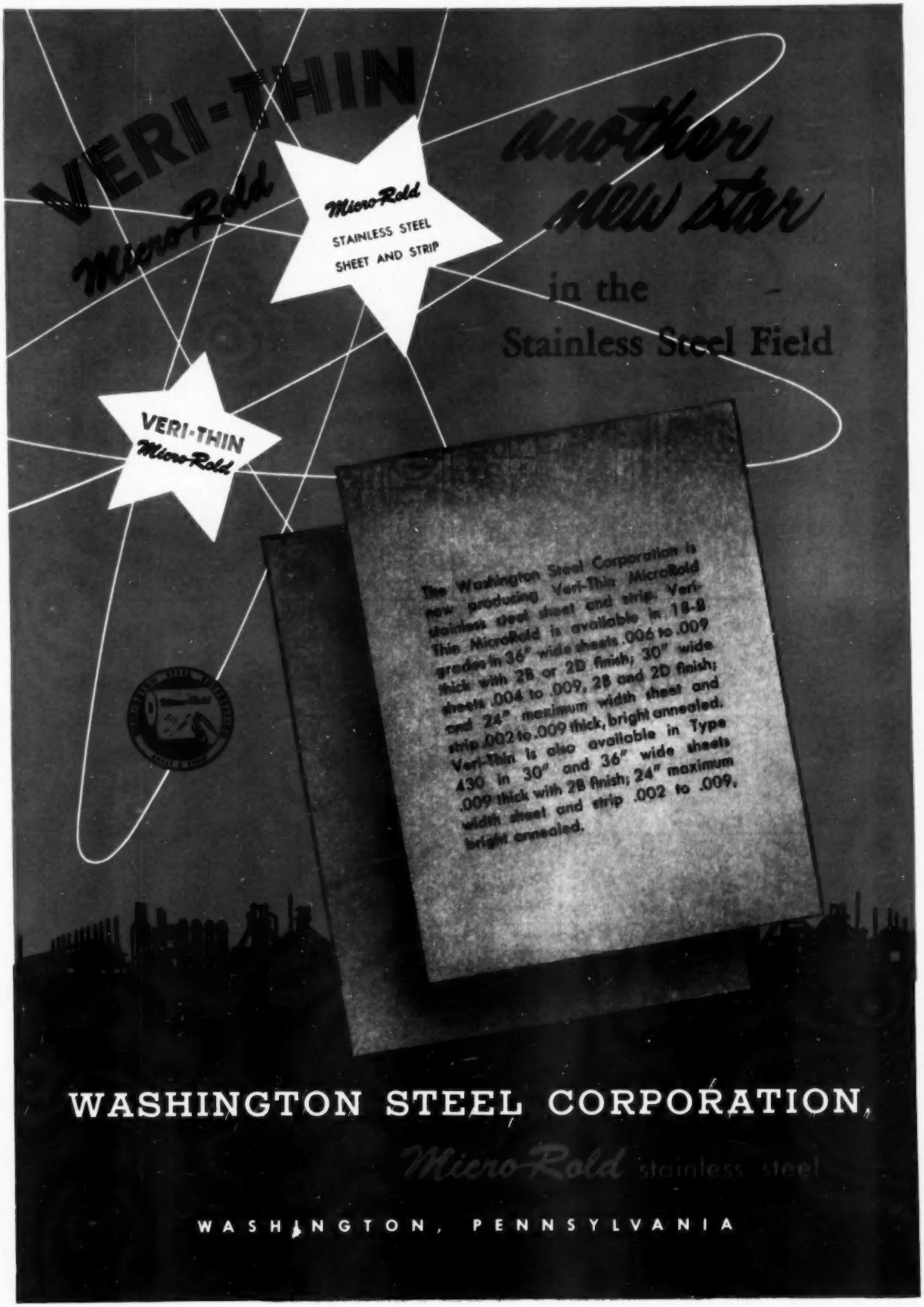
Whenever manufacturers of cooling equipment hold district schools, Mr. Fritch sends as many of his mechanics as he can spare. In this manner he is able to keep his staff informed on the latest installation and service procedures. Recently, Mr. Fritch and two of his installers returned from a two-day school in St. Louis, 150 miles away. "The expenses of attending these training classes pay for themselves tenfold", says Mr. Fritch, "because the classes not only provide information but they give the men confidence in themselves."



CEILING DIFFUSERS *(arrow)* will be used in this unfinished basement playroom. The openings at right are to be covered with glass, will admit outside light

HOT WEATHER HOUSING DESIGN

THE PRINCIPLES of hot weather housing design are discussed in the booklet *Physiological Objectives in Hot Weather Housing* (45 cents), available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25. In addition to detailed plans for climatic protection in hot dry and warm humid environments, much technical information is given on basic climatology in tropical and subtropical regions, including data on air temperature, vapor pressure, air movement and radiant energy.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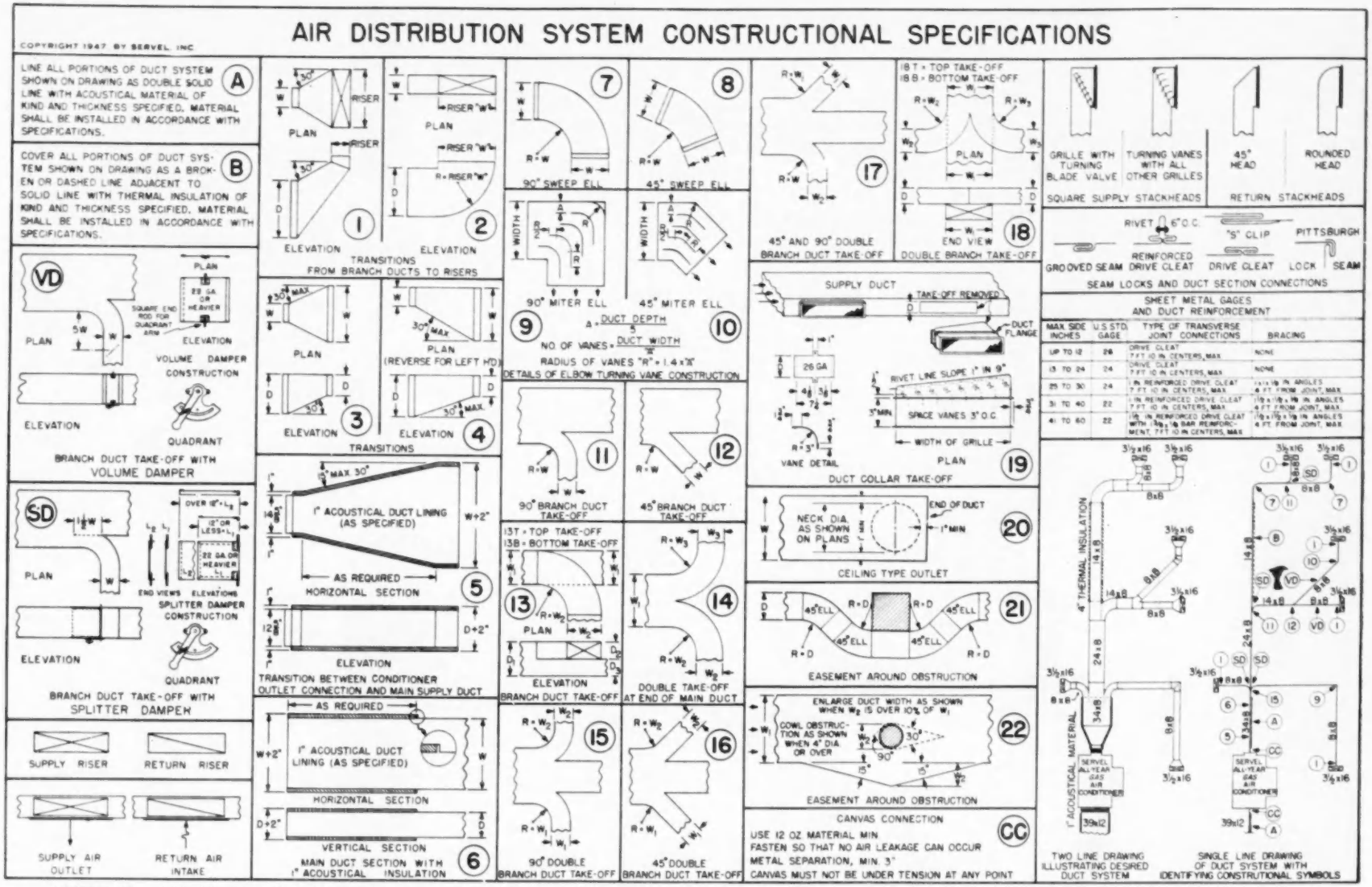
The Washington Steel Corporation is now producing Veri-Thin MicroRold stainless steel sheet and strip. Veri-Thin MicroRold is available in 18-8 grades in 36" wide sheets .006 to .009 thick with 2B or 2D finish, 30" wide sheets .004 to .009, 2B and 2D finish; and 24" maximum width sheet and strip .002 to .009 thick, bright annealed. Veri-Thin is also available in Type 430 in 30" and 36" wide sheets .009 thick with 2B finish; 24" maximum width sheet and strip .002 to .009, bright annealed.
WASHINGTON STEEL CORPORATION
Micro-Rold stainless steel
WASHINGTON, PENNSYLVANIA

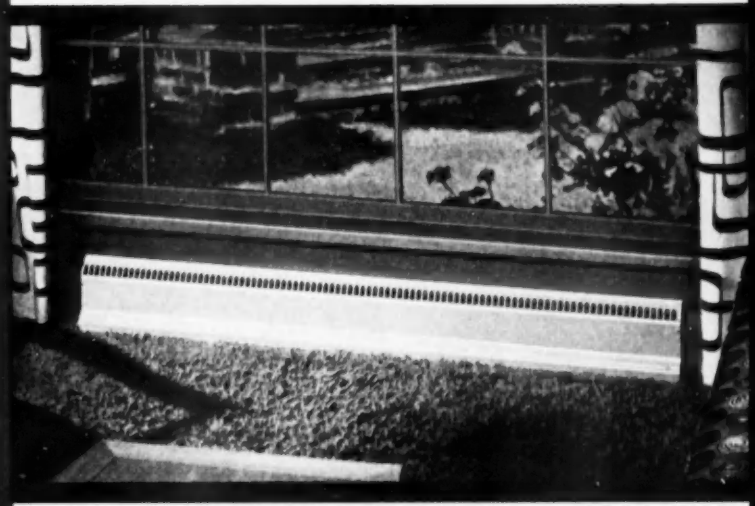


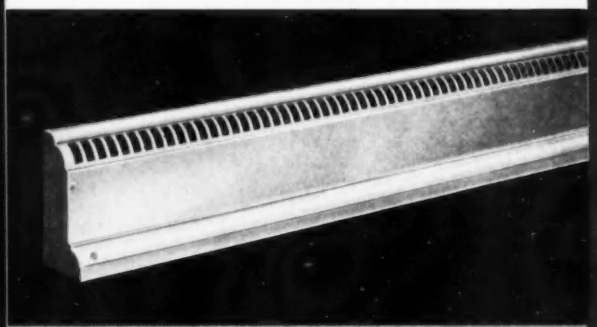
AMERICAN ARTISAN RECEIVES letters daily from its readers requesting a variety of information. One of the most frequent requests has been for a table of sketches showing constructional specifications and symbols used for shop drawings of air distribution systems. Sheet metal contractors and warm air heating dealers can use the data given here when planning difficult ductwork layouts. (This sheet was compiled by Servel, Inc., and is reproduced by special permission of the copyright owners)

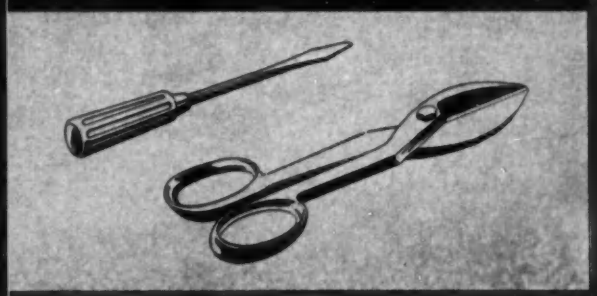
Air Control

Announces the newest in baseboard perimeter diffusers

here, at last, is the one
baseboard diffuser that gives you
the finest modern styling and
truly superior performance . . .
yet costs far, far less.







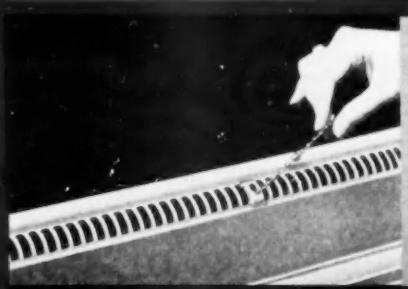
In two foot and four foot lengths . . .

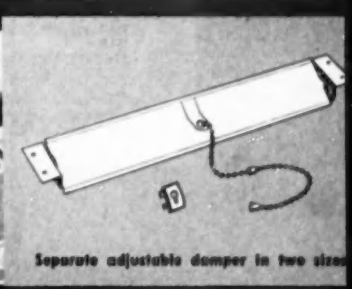
. . . to blanket any wall, any window.

Your own experienced eye will tell you that here is the diffuser! In construction, it is simplicity itself. Using only a tin snips and a screw driver, it is completely installed in a matter of minutes. For big walls and windows, just combine as many units as you need with handy connector strips to thoroughly, comfortably blanket any area.

Yes, the new Air Control Baseboard Diffuser puts the very latest developments in perimeter diffusion at your service. It is truly new . . . an advanced design that assures you of efficient, economical installations. And it has the eye-appeal that is sure to earn the home owners approval.

Install it in minutes with only a snips and a screw driver





Separate adjustable damper in two sizes

AIR CONTROL

At your Jobbers
soon!
Ask for Bulletin
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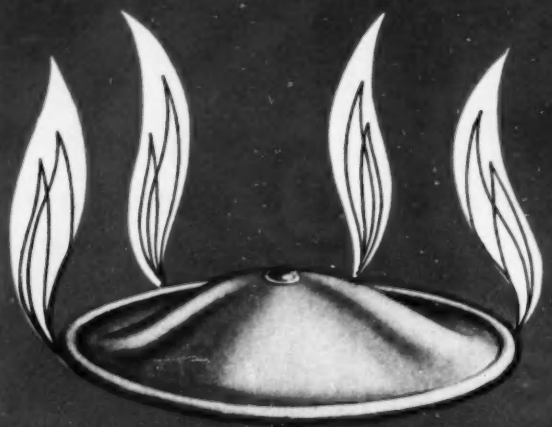


UPSHOT TUBULAR STEEL GAS CONVERSION BURNER — PLATE TYPE — WITH CONTROL COVER

MODEL	VALVE SIZE	REGULATOR SIZE	MAXIMUM BTU/HR. Nat. Mxd.	BTU/HR. Mfd.	APPROX. SHIPPING WT.
*TSE	¾"	¾"	210,000	140,000	45 lbs.
**TSA	1"	1"	370,000	250,000	48 lbs.
TSB	1"	1¼"	400,000	330,000	51 lbs.
TSX	1¼"	1¼"		400,000	53 lbs.

Minimum input rating on above models is 70,000 Btu/hr.

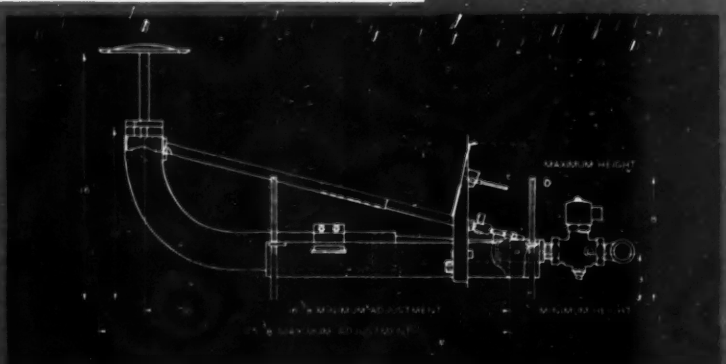
All necessary controls furnished except limit control. Burners for use with natural and mixed gases are equipped with solenoid type valve unless otherwise specified. Burners for use with manufactured gas are equipped with diaphragm type valve unless otherwise specified. Manufactured gas burners are also equipped with a pilot line gum filter. One size (6 inch diameter approximately) stainless steel spreader plate is standard on all gases.
Runner flame pilot lighter is available at extra charge.

UPSHOT TUBULAR STEEL GAS CONVERSION BURNER — PLATE TYPE — WITH CONTROL COVER for use with LIQUIFIED PETROLEUM — and BUTANE AIR GASES

MODEL	VALVE SIZE	REGULATOR SIZE	MAXIMUM BTU/HR.	APPROX. SHIPPING WTS.
TSLP	½"	NONE	200,000	45 lbs.
TSLP-Air	1¼"	1¼"	300,000	53 lbs.

Minimum input rating on above models is 70,000 Btu/hr.

All necessary controls are furnished except limit control. 100% shut-off type pilots are standard equipment. One standard stainless steel spreader (6 inch approximately) only, is furnished.



BY ADAMS

IN THE MODERN TEMPO . . .

AMERICA'S MOST BEAUTIFUL BURNER!

Here is truly a burner in the modern tempo! "Best by Heat Test" . . . and designed for mass production in steel! A package burner for fast, one-man installation. Light in weight and priced competitively, yet of the finest-quality materials to insure customer satisfaction. Adaptable for all installations where upshot burners can be used.

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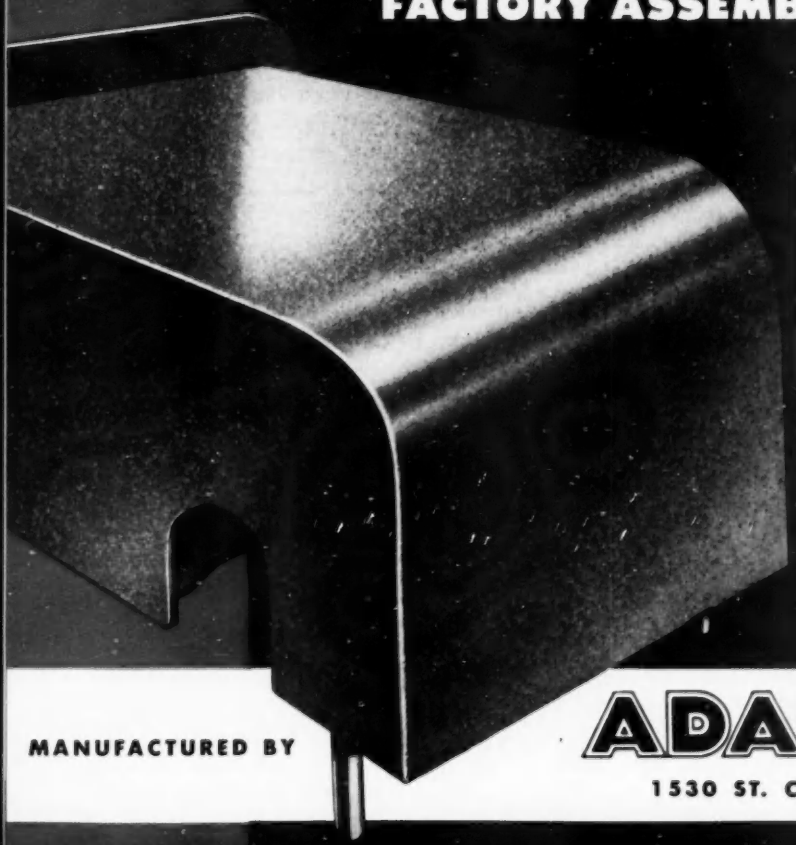


AGA TESTED AND CERTIFIED

RUNNER FLAME PILOT LIGHTER
(optional equipment)

36-MONTH FACTORY WARRANTY
Factory warranty against defective materials or workmanship in the burner assembly for three years. Controls such as thermostat and pilot are covered by regular warranty of control manufacturers.

MANUFACTURED BY **ADAMS MANUFACTURING CO.**
1530 ST. CLAIR AVE. • CLEVELAND, OHIO

GUARANTEE MAY BE VOID —

(Continued from page 91)

Later when the lumber company sued the bank to recover on this promise of payment for the material that had been furnished, the court held the contract was void and unenforceable under this statute since it was not in writing.

"The object and intent of the statute is to deny the imposition of a liability by parol on two persons to pay the debt of one. If the beneficiary or person for whose use the goods are furnished is liable at all by reason thereof, any other promise by a third person to pay the same debt must be in writing, otherwise it is void by operation of the provisions of the Statute of Frauds.

"It would be a dangerous rule and one calculated to promote the perpetration of the very frauds against which the statute was intended to guard in this class of cases to permit a party furnishing lumber or materials for the erection of a building to recover upon a verbal promise by the bank to pay for such material.

"True, where the money loaned is paid out as the building progresses it is to the interest of the lender to see that materials are paid for by the borrower, but if the material man expects to rely upon the money loaned, for payment, it is a very simple matter to make the arrangement with the lender in a written promise for that purpose, which is the requirement of the Statute of Frauds."

Verbal Promise Can Be Binding

In further consideration of the action by the warm air heating firm against the owner of the property on her oral contract for payment, the court outlined the circumstances under which such a promise, although not in writing, is enforceable.

"A consideration to support a promise not in writing, to pay the debt of another, must operate to the advantage of the person making the promise and place him under a pecuniary obligation to the person to whom the promise is made, independent of the original debt, which obligation is to be discharged by the payment of that debt."

In support of this ruling the court referred to a case in which a contractor promised the workmen of a subcontractor that if they would not abandon the work, as they were about to do, but would continue, he would guarantee the payment of their wages.

Sustaining in this instance the judgment in favor of the workmen on this guarantee which was not in writing, the court said in distinguishing this case from those instances in which the promise was required by the statute to be in writing,

"Where the leading purpose of a person who agrees to pay the debt of another is to gain some advantage or promote some interest or purpose of his own, and not to become a mere guarantor on surety of another's debtor, and if the promise is made on sufficient consideration it will be valid although not in writing. The promise is a direct undertaking on the part of the person promising to pay, not upon the failure of the debtor to pay, but to pay the debt."

Hold Owner Made "Collateral" Promise

A short time before, this same court said of this principle of law,

"The terms 'original and collateral promise,' though not used in the statute, are convenient enough to distinguish between cases where the direct and leading object of the promise is to become the surety or guarantor of another's debt and where, although the effect of the promise is to pay he debt of another, yet the leading object of the one making the promise is to subserve or promote some interest or purpose of his own.

"The former, whether made before or after or at the same time with the promise of the principal, is not valid unless manifested by evidence in writing. The latter, if made on good consideration, is unaffected by the statute because, although the effect of it is to release or suspend the debt of another, yet that is not the leading object on the part of the person making the promise."

In its decision reversing the judgment of the lower court and holding that this warm air heating dealer could not recover on this oral agreement of the owner that, "I'll see you get your money," the court said in conclusion,

"We think the promise made by the owner is within the principle hereinbefore set forth, a promise to answer for the debt of the general contractor for the eight furnaces which this warm air heating firm had then furnished. The authorities appear entirely harmonious in support of the rule that if the beneficiary or person for whose use the goods are furnished is liable at all by reason thereof, any other promise by a third person to pay the same debt must be in writing; otherwise it is void by operation of the provisions of the Statute of Frauds."

[Note: While this discussion applies to actual cases, it should be remembered that legal rules vary in different states.]

BOOK DESCRIBES CONTROL SYSTEMS

CONTROLS AND control circuits for heating and cooling systems are described by John E. Haines, vice president, Minneapolis-Honeywell Regulator Co., in his book, *Automatic Control of Heating and Air Conditioning*. The subjects covered range from the domestic hand fired furnace to large multiple commercial systems using zone control.

One chapter is specifically directed to automatic control of domestic equipment; gas, oil and coal fired systems are outlined and recommendations are made for large residences where zone control is desirable. In another chapter the controls required for refrigeration systems used in air cooling are explained and circuit recommendations are given for several different applications.

The book is available at general book stores, for $6.75 a copy. It is published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36.

NOW there is a

Skuttle—the leader in humidification—has forged ahead again. *Now* Skuttle offers the *only* complete line of humidifiers . . . to meet the needs of *every* home . . . with any type heating plant. Warm air . . . winter air conditioning . . . space heater . . . steam . . . hot water . . . vapor . . . there is a Skuttle to do the job . . . better.

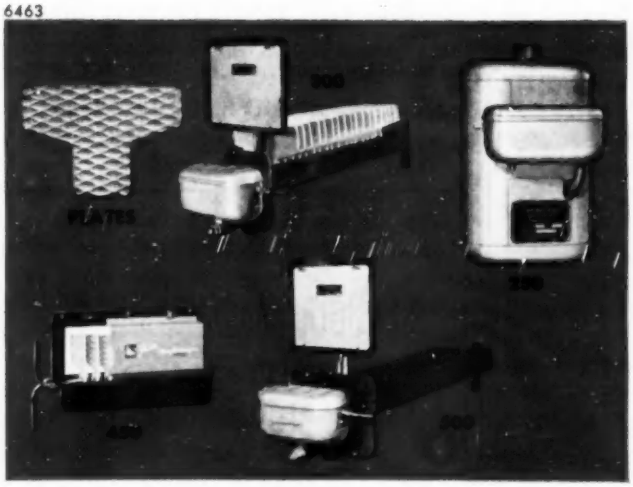
Here's the complete line—and remember, valves, floats and other operating parts are interchangeable, reducing *your* stock.

Skuttle
MANUFACTURING COMPANY
3099 BEAUFAIT DETROIT 7, MICH.

Skuttle Series 600

The most popular humidifier for many years. For all standard type automatic fired warm air furnaces, including gravity and winter air conditioning. Easily installed. Self-flushing—self-cleaning. Patented Vapoglas plates for efficient evaporation. Blown glass float—can't leak. Chrome and nickel plated valve parts—aluminum plate rack to eliminate electronic corrosion. Double coated acid and alkali resisting porcelain enamel pan and float chamber.

6463



Skuttle Model 450

For warm air furnaces where space doesn't permit a Series 600. Model 450 can be used if there is 3" space between furnace and casing—counterflow—floor and other furnaces and space heaters.

Skuttle Model 250—Gas Fired

Independently gas fired for steam, hot water and perimeter heated homes.

Skuttle Series 300 for Large Homes

Holds up to 35 Vapoglas plates—for large homes.

Skuttle Series 500 for Coal Fired Warm Air Heat

Needs no plates—for use in high temperature plenums.

Patented Vapoglas Evaporating Plates

Pure glass wool compressed under heat. The most efficient plate you can get. All evaporating plates should be replaced when clogged with water chemicals—about once a year.

Selling Price MINUS Original Cost MINUS Installation Expense EQUALS DEALER'S PROFIT

EVER WONDER why it is the SEQUOIA dealer consistently gets the close-margin heating jobs? Ten-to-one his secret is simply this: SEQUOIA knows the importance of installation costs in every dealer's profit formula. And so its gas furnaces are carefully designed for fast, easy (profitable) installing!

CLOSET'EER models, for example (the wide face-shallow depth series that is such a big seller for today's modest-cost homes) are an installer's favorite! All controls are conveniently grouped right on the face . . . every duct, vent, gas and electrical connection is within easy arm's reach!

HORIZONTALS . . . and Sequoia makes 5 of 'em, 70,000 to 150,000 BTU . . . also are compactly engineered for easiest handling. A special point: they'll pass through most scuttle holes without case disassembly.

If it's important to you to handle top quality gas furnaces that are competitively priced . . . profitable to install . . . and trouble-free performers, write for information regarding a SEQUOIA dealership. Address your letter to—

Sales Department

SEQUOIA MANUFACTURING CO.

1000 BRITTAN AVENUE
SAN CARLOS 3, CALIFORNIA

STACK BOOT FITTING —

(*Continued from page 96*)

formula *sq ft of face area = volume ÷ velocity*, we find that this example will require a duct with 5.6 sq ft of area (14,000 ÷ 2500 = 5.6), which is equal to a round duct 32 in. in diameter. Next assume that a 20 per cent velocity decrease is required to allow the dust particles to settle out of the air while still removing the same volume of air. Thus 20 per cent of 2500 fpm = 500, which, when substracted from 2500, leaves 2000 fpm, the velocity for which the discharge duct will be sized. The fan capacity of 14,000 cfm does not change. 14,000 ÷ 2000 = 7 sq ft, which is the equivalent area of a 36 in. round duct.

The static pressure loss per 100 ft in a 32 in. round duct at a volume of 14,000 cfm and a 2500 fpm velocity is 0.21 in. water gage. Increasing the duct diameter to 36 in. with the same volume of 14,000 cfm but using a velocity of 2000 fpm, the static pressure loss per 100 ft of round duct drops to 0.14 in. WG. This drop in static pressure will conserve electric power.

A fitting of this type is used in the system shown in Fig. 1, where the blower discharge is connected to the exhaust stack. The following is a step by step analysis of the pattern problem solution:

To Construct the Simplified Front View, Fig. 2:

(a) Draw the rectangle W, X, Y, 1; 4⅛ in. × 1½ in. Bisect the line 1-Y and draw the horizontal center line. Where this bisects line W-X, mark the point R′, and where the center line bisects line 1-Y, mark point R″.

(b) From point R″, measure 2⅜ in. along the horizontal center line and establish the point O′. Through point O′ draw a line at 45 deg to the horizontal center line and mark this line CL, as a center line for the offset.

(c) At the point where the 45 deg center line and line W-1 intersect, mark the point V. From this point, measure 1 15/16 in. along the 45 deg line and mark the point O″. Through this point draw a line perpendicular to the 45 deg center line.

(d) From point O″, measure ¾ in. on both sides of the center line and mark the points M′ and D′.

(e) With the intersection points of the horizontal center line, marked R′ and R″, as centers, and a radius of ¾ in., draw arcs from points W and 1, respectively.

(f) Extend line W-1, ⅝ in. beyond points 1 and W; divide the ⅝ in. lines into three equal spaces; through the points draw lines perpendicular to line W-1 to intersect the arcs which were made with the ¾ in. radius at points 2,3 and 4, and A,B, and C. From the arc intersection points, draw lines parallel to line W-1.

(g) From point M′, draw a line parallel to the 45 deg center line to intersect the horizontal line drawn through point 4; mark this point M. Mark the points of intersection of the 45 deg line M-M′ and horizontal lines 1,2 and 3, with the letters P, O, N.

(h) From point D′, draw a line parallel to the 45 deg center line to intersect horizontal line 4, and mark this point Q.

(j) From point D′, measure ¼ in. Mark this point D″, designating the distance from point D″ to Q as line G. From point D″ draw line D at a 15 deg angle to line G and intersecting horizontal line W-1 at point T. Draw the line T-Q.

(k) From point D″ draw line E to intersect horizontal line C-2 and mark this point S. From point D″ draw line F to intersect horizontal line B-3 and mark this point R.

(l) From points Q, R, S, and T, on line Q-T draw lines perpendicular to line Q-T. Transfer lengths A, B, and C, to corresponding perpendicular lines drawn through points Q, R, and S, and mark the end points 5, 6, and 7. Through these points draw the developed shape to point T. From point 5 draw a line parallel to line Q-T and mark the fall distances A′, B′, and C′.

(m) Designate distance M′-P as line H, M′-O as line J, M′-N as line K and M′-M as line L, and the distance from O″ to where the 45 deg center line crosses line O-M as distance U.

To Develop the Half Pattern, Fig. 3:

(a) Draw the 1½ in. 45 deg line marked D″-M″. From points D″ and M″ draw ¼ in. lines parallel to the center line and mark the end points Z and L′. Draw an extended line through points Z and L′. Working from point L′, measure ⅝ in., which is equal to the half width of the rectangular duct as shown on Fig. 1. Mark the end point H′.

(b) Divide the ⅝ in. line L′-H′ into three equal spaces and mark the division points K′, J′, and H′. Through the points draw lines perpendicular to line Z-H′.

(c) Transfer lengths L, K, J, and H, from Fig. 2 to the corresponding lines on the half pattern, Fig. 3, and through the developed points draw the intersection line of the straight side and the 1½ in. diameter pipe.

(d) Measure line G on Fig. 2. With D″ on Fig. 3 as center and radius G, draw an arc. Measure line M-Q on Fig. 2 and with L″ on Fig. 3 as center and radius M-Q, cut the arc G and mark the intersection point 5′. Connect points L″ and 5′ with a straight line.

(e) Draw a right angle. From Fig. 2 transfer line F to the vertical leg and fall distance C to the horizontal leg. The hypotenuse line C-F is the true length line. With D″, Fig. 3, as center and radius C-F draw an arc. On the developed travel curve line T-5, Fig. 2, measure arc 5-6, and with 5′ on Fig. 3 as center, cut arc C-F and mark the intersection point 6′.

(f) Line E and fall distance B are transferred from Fig. 2 to the vertical and horizontal legs of a right angle and the hypotenuse B-E is the true length line. With B-E as radius and point D″ on Fig. 3 as center, draw an arc. With arc length 6-7 on the developed curve line T-5, Fig. 2, as radius and point 6′ on Fig. 3 as center, cut the arc B-E and mark the intersection point 7′.

(g) On a right angle, transfer line D from Fig. 2 to the vertical leg and fall distance A to the horizontal leg.

The hypotenuse A-D is the true length line. With D″ on Fig. 3 as center and radius A-D draw an arc. Measure the arc length 7-T on the developed curve line T-5, Fig. 2, and with point 7′ on Fig. 3 as center, cut arc A-D and mark the intersection point T′.

(h) Measure line D on Fig. 2 and with point T′ on Fig. 3 as center and radius D, draw an arc. With point D″ on Fig. 3 as center and radius 5/8 in., cut arc D and mark the intersection point T″. (*Note*: The 5/8 in. radius is equal to the half width of the rectangular end of the fitting, shown as the end view in Fig. 2).

(j) Through the developed points draw the outline of the half pattern.

To Develop Opening to Exhaust Stack, Fig. 4:

(a) To find the half circumference of the round duct, multiply the given radius by the constant 3.14. Thus, $3.14 \times 0.75 = 2\frac{3}{8}$ in.

(b) Draw a rectangle $4\frac{1}{8}$ in. $\times$ $2\frac{3}{8}$ in. From the $4\frac{1}{8}$ in. side, measure 1-3/16 in. and draw the horizontal center line. Establish points 1″, Y′, W′ and X′ at the corners of the rectangle.

(c) From the arc with a 3/4 in. radius, Fig. 2, transfer arc spacing 1-2, 2-3, and 3-4 to both sides of the center line of Fig. 4, and along line 1″-Y′. Mark the points 1′, 2′, 3′, 4′. Through these points draw lines parallel to the center line.

(d) On Fig. 2, measure the distances from line 1-Y to points P, O, N, and M, and working from line 1″-Y′, Fig. 4, transfer these distances to the corresponding lines on both sides of the center line and mark the points M, N, O, and P.

(e) Working from line W-X on Fig. 2 measure the distances from this line to points Q, R, S, and T. With line W′-X on Fig. 4 as the working line, transfer these distances to the corresponding lines on both sides of the center line and mark the points Q, R, S, and T′. Through the developed points draw the outline of the developed opening in the round duct.

Add the necessary allowances for flanges and rivet seams. Mark off the rivet holes, and mark the patterns for fabrication.

DOUBLE-BARRELED PLAN —

(*Continued from page 93*)

board under the "on order" classifications. When units are received at the dock, the stockman gets the tags from the front office board for the units received and staples or attaches the bottom half of the tag onto the unit, placing it in the warehouse. The other half of the tag is placed on the front office board under its proper classification (forced air gas, forced air oil, oil conversion, etc.). When the unit is sold, the tag is removed from the front office board and placed on the job clip board in the shop office under the proper job number.

As a result of this system, the shop foreman can tell at a glance every job for which a unit is on hand. If he has a job on his board for which there is no unit tag, he can check the front board to see when it was ordered and thus determine approximately when it will arrive.

A salesman knows that any tag on the front office board represents a unit that is available for immediate delivery. If he has an immediate delivery sale for a unit not shown in stock, he usually can find a similar unit stock tag attached to a job order in the shop. If the job is not scheduled for immediate installation, he may "rob" this job of the unit by having a new purchase order and tag made out to cover the job that has been "robbed."

There are usually 30 to 40 furnaces in the warehouse which are tagged for installation, giving the company a good stock of units to work from.

Mr. Schaal himself contributes to the program by taking part in such enterprises as home shows, and by active participation in associations. He is a charter member of the Des Moines Heating Dealer's Association and has just completed a term as its secretary-treasurer.

Feeling that employee identification with the company is the best way to insure customer satisfaction, Mr. Schaal is now planning a program by which some employees will be able to invest in the firm. The plan was suggested when an employee said, a few months ago, that he would rather have money invested in the company than accept the raise he had been offered. Mr. Schaal has another reason for the plan. He feels it to be insurance that the business will go on after he retires.

2/3 OF MODEL HOMES INCLUDE COOLING

In a national contemporary home promotion, the staff of *Better Homes and Gardens* magazine recently designed a "readers' choice" 1953 model home, which was built for display by 43 builders throughout the country. Because of many climate variations, the choice of heating and air conditioning systems was left to the local builder.

A survey of these builders revealed that two-thirds of them have installed a year 'round air conditioning system, or have provided facilities that will make it possible to adapt cooling equipment to existing heating systems with a minimum of alterations.

The choice between a single combination heating-air conditioning unit and two smaller, separate combinations was evenly divided. Climate demands and geographical locations guided the choice.

Forced warm air perimeter heating was the unanimous choice of the builders.

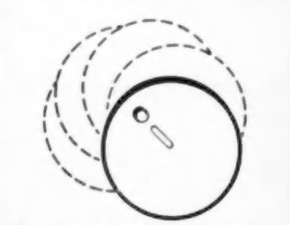
Draft Control inaccuracy means fuel waste-

1% for every 1/100" of excess draft*

Is Field's unmatched quality important to you? It *is* because *fuel economy* is important. An inaccurate draft control will commonly permit up to 5/100" of excess draft — a fuel waste up to 5%. That's why wise dealers insist on a Field Control, set with instruments. They know that only a precise Field permits a setting, accurate to within 1/100" — without risk of too little draft, without the waste of excess draft. A score of years, and millions of installations have proven Field's performance.

*Fuel waste without any draft control runs up to 20%; with an inaccurate control 5% fuel wastes are common.

BALANCING FIELD GATES: Steel today varies up to 10% over or under gauge measurements—sufficient to cause errors in draft control performance as great as draft changes of 5/100" or more. To correct these steel tolerances Field gates are counterbalanced using a Duo-Static Balancer.



Eccentric adjustment for balancing gate in the vertical plane, second of two adjustments.

that's why a superbly accurate Field Control saves several times its cost the *first* year

1 — **Made of heavy materials** — Field controls last longer

2 — **Balanced at factory** — Eliminating weight variations which could affect control's accuracy.

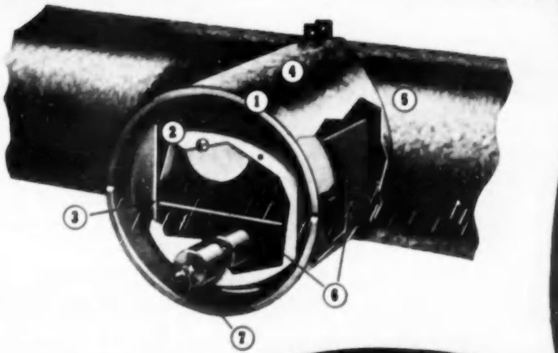
3 — **Rocker type hinge pin**—Quickly responsive, no friction. No sticking.

4 — **Long Collar** — No warping or clogging due to heat or soot, no service calls.

5 — **Free smoke passage** — A Field Control never blocks the flue.

6 — **Side wings and fitted gate** — More accurate because opening in control increases more uniformly.

7 — **Factory adjusted** — Set to maintain .06" draft until instrument setting is made.



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FIELD CONTROL DIVISION

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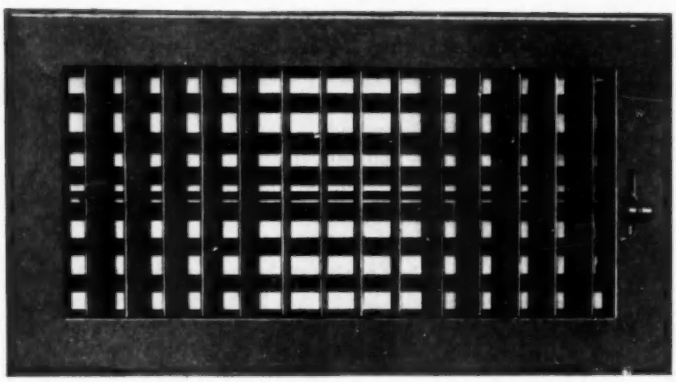
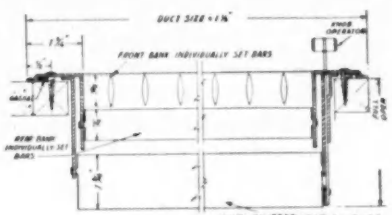
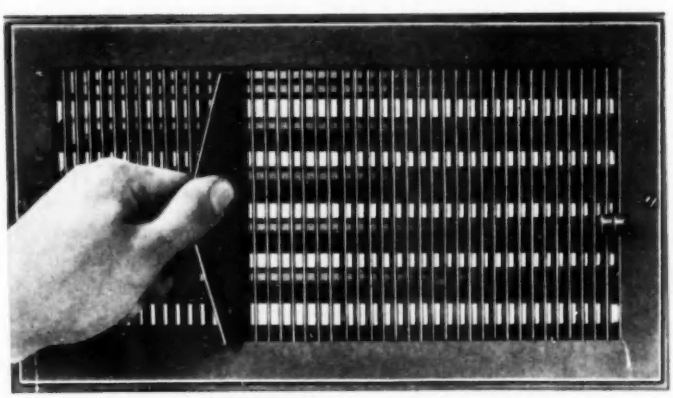


Minimum Resistance, Best Air Distribution, Complete Air Control, which spreads air evenly, which cannot be done with the so-called "opposed valves." U. S. Standard Valve operation does the job perfectly — causes no "Back-of-Valves" Turbulence and Resistance which is developed by partly-open "opposed valves." LEVER OPERATED — KEY OPERATED — REMOVABLE KEY OPERATION.



HORIZONTAL CROSS SECTION #190



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WHAT ASSOCIATIONS ARE DOING

Suggest Service Warranty

A RECENT bulletin from the Detroit Warm Air Heating Association discusses the problem of warranty service. The bulletin points out that while a manufacturer may replace a defective part without charge, he does not pay the contractor for the time spent in removing the faulty part and installing a new one. A warranty similar to the following is suggested:

"We guarantee that the design and capacity of this installation is as agreed upon, that all materials and workmanship are of high quality and that we will replace any parts which may be found defective within a period of (manufacturer's guarantee time)."

It should then be specified whether the customer or the dealer is to pay for any labor charges involved in the replacement job and a corresponding rate should be quoted.

For customers requesting a guarantee covering a period of time, the following form is suggested:

"We guarantee the trouble free operation of this installation, and agree to repair any deficiencies or failures without further cost to the customer for the time and rate below specified."

In conclusion, the bulletin suggests that all warranties and service costs charged to them be kept in separate accounts so that eventually the firm will know exactly what its warranty costs are in terms of percentage for each type of warranty.

Carolinas Group Appoints Standing Committees

W. T. FORT, president, Carolinas Roofing and Sheet Metal Contractors Association, has appointed the following standing committees for the year:

Joint Construction Committee: Rudy Barnes, chairman; J. H. Piper; E. L. Scott; and John Stanley.

Agenda Committee for Florida, Georgia, North and South Carolina: J. Roy Martin, chairman; W. R. Hartin, Jr.; Lokie Martin; and James Barger.

Membership Committee: Gerald Stewart, chairman; and Evans Spell.

Labor Relations Committee: Lokie Martin, chairman; and Josh Ware.

Suppliers Relations Committee: John Southall, chairman; Roy S. Garmon; and C. E. Bourne.

Convention Committee: W. H. Arthur, Jr., and Rudy Barnes.

Sign and Emblem Committee: Bob Pickins.

Warm Air Heating Committee: Bob Foster, chairman; and Wayne Miller.

Advisory Committee: Gordon Waters, chairman; Earl DeLay; Linwood Scott; and Luke Ledbetter.

Sick and Welfare Committee: Beverley Rose.

Legislative Committee: Vardry Ramseur, Jr., chairman; Horace King; and Jim Kyle.

The 1954 Indoor Comfort Conference will be held in Raleigh. H. L. Godwin is chairman.

Indiana Past President Heads Building Congress

WILLIAM GARBER, JR., past president of the Sheet Metal and Warm Air Heating Contractors Association of Indiana, was recently elected president of the Building Congress of Indiana. Mr. Garber is the owner of Farquar Heating Service Co., Indianapolis, and is a member of the American Society of Heating and Ventilating Engineers. He has represented his industry in the Building Congress for the past 10 years and served as vice president of that organization for the last two years.

Coming Events

Nov. 9-12 — 8th All-Industry Refrigeration & Air Conditioning Exposition, Public Auditorium, Cleveland. Sponsored by Refrigeration Equipment Manufacturers Association. W. A. Siegfried, General Chairman, 1509 W. Liberty Ave., Pittsburgh 26.

Dec. 2-3 — National Warm Air Heating and Air Conditioning Association, Annual Convention. Hotel Cleveland, Cleveland. George Boeddener, Managing Director, 145 Public Sq., Cleveland 14.

Dec. 7-9 — National Heating Wholesalers Association, Inc., Annual Convention. Conrad Hilton Hotel, Chicago. C. Stuart Rambo, Executive Secretary, 27 E. Monroe St., Chicago 3.

Jan. 25-27 — American Society of Heating and Ventilating Engineers, 60th Annual Meeting. Rice Hotel, Houston. A. V. Hutchinson, Secretary, 62 Worth St., New York 13.

Feb. 4-5 — Sheet Metal and Warm Air Heating Contractors' Association of Indiana, Annual Convention. Hotel Severin, Indianapolis. Frank E. Anderson, Executive Secretary, 439 S. 17th St., Terre Haute, Ind.

Feb. 11-13 — Sheet Metal and Roofing Contractors Association of Minnesota, Annual Convention. Radisson Hotel, Minneapolis. Arlowe W. Esau, Secretary, Mapleton, Minn.

Feb. 24-25 — Michigan Heating and Sheet Metal Association, Annual Convention. Pantlind Hotel, Grand Rapids. N. J. Biddle, Secretary, 3035 E. Grand Blvd., Detroit 2.

March 8-10 — Sheet Metal Contractors Association of Wisconsin, Inc., Annual Convention. Schroeder Hotel, Milwaukee. Irv. F. Kanitz, Secretary, 225 E. Michigan St., Milwaukee 2.

April 20-22 — Sheet Metal Contractors Association of Illinois, Inc., Annual Convention. Abraham Lincoln Hotel, Springfield. E. A. Schmidt, Secretary, 1210 E. Laurel St., Springfield.

THE GRAND Rapids Heating Association has been displaying this emblem in ads running in the building pages of local newspapers

Grand Rapids Holds Year's First Meeting

FORTY-SIX members attended the first regular meeting of the year held by the Grand Rapids Heating Association, with Herbert F. Steigmeyer presiding for the first time since his election as president. Bob Boelens, smoke inspector of the City of Grand Rapids, gave an interesting talk on the municipal heating ordinance — how it works and what is expected of the contractors licensed under it.

The secretary explained that a committee of four had called on the local manager of the classified directory section of the telephone company with the idea of securing a reduction in the number of listings which pertain to the heating industry. The committee suggested the heading *Heating Contractor*, with cross index references for all others involved. Jay Biddle, executive secretary of the Michigan Heating and Sheet Metal Association and Earle Oole, president of the state association, have been notified of the committee's work and have volunteered their cooperation on a statewide basis.

The association has obtained permission from the National Warm Air Heating and Air Conditioning Association to adopt the *Indoor Comfort* emblem for use on letterheads, invoices, advertisements, etc. The newspapers have been given mats in three sizes for use as members may require them for tie-in advertising.

Canadian Group Sponsors Heating Series

C. W. NESSELL, Minneapolis-Honeywell Regulator Co., is conducting a series of meetings on warm air heating trends under the sponsorship of the Canadian chapter of the National Warm Air Heating and Air Conditioning Association. Meetings were held in Windsor, London and Hamilton on October 14, 15 and 16. Other meetings are scheduled for Toronto, October 19 and 20; Kingston, October 21; Ottawa, October 22; and Montreal, October 23.

Test papers written by delegates to the 1953 schools have been checked, with the exception of the French language tests from the Quebec City class. Of the 149 delegates who submitted papers, 79 qualified for a Canadian chapter certificate by earning a mark of 80 or over. There are now 614 Canadian chapter qualification certificates held by warm air heating men throughout the country.

Rochester Host at Sheet Metal Convention

HOSTS at the forthcoming convention of the New York State Sheet Metal, Roofing and Air Conditioning Contractors Association, scheduled to be held in Rochester, will be the Master Sheet Metal Furnace and Roofers Association. Monty Childs has been appointed chairman of the convention committee.

Indiana Bulletin Discusses Service Tax

THE BULLETIN of the Sheet Metal and Warm Air Heating Contractors Association of Indiana reports a recent ruling of the Indiana State Revenue Department on a sales and service tax. This ruling provides that effective July 1, 1953, receipts from all contracts for the manufacture, fabrication and other creation of tangible personal property made especially for the buyer and not suitable for sale to others in the ordinary course of the taxpayer's business will, for the purpose of determining whether or not the transaction is in interstate commerce, be treated as receipts from essentially service items rather than from sales.

The bulletin points out that the Department of Revenue does not expect this ruling to have much effect in the matter of changing the applicable rate of taxation, but will be of great consequence in determining whether or not transactions are in interstate commerce.

Quoting from an Indiana Manufacturers Association legislation-taxation letter, the bulletin says:

"In the case of component parts to be used by another in the business of manufacturing, it seems that the rate of one-quarter of 1 per cent would apply, but there is an indication that the department wishes to tax the income from shipping such parts out of the state at this same rate, on the theory that the sale of such parts is really a service and not a sale subject to interstate immunity. In the case of a finished or complete product salable and usable only to the person contracting, the ruling seems to indicate an intent to tax at the rate of 1 per cent in cases where delivery is made in Indiana, as well as where fabrication takes place here and delivery is made out of state. This latter situation poses a very important legal question in cases of sales to the federal government, shipments being made out of state for delivery. If an argument that almost all materials manufactured for the government are such as to be usable only by the government could be substantiated, then a great number of items would appear to be taxable as a service."

Halt Proposed Burner Legislation

A NEW JERSEY legislative bill that would have prevented anyone other than a licensed electrician from making an electrical hookup of oil burning equipment has been shelved indefinitely. Oil Heat Institute has said this was possible because of the cooperation between distributor and dealer associations, and has cited it as another example of the effectiveness that is possible when dealers work together as an industry group.

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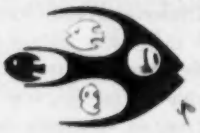
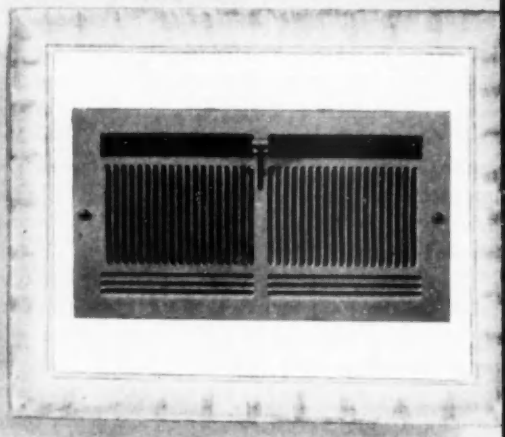


Standard's new perimeter Wall register gives 4 way diffusion along the outer cold walls for balanced warm air circulation. Standard's exclusive, new Fractionator Volume Control means one-time setting for positive air control. When you use Standard Perimeter Wall or Baseboard registers you are giving complete hemispheric heating and cooling comfort.



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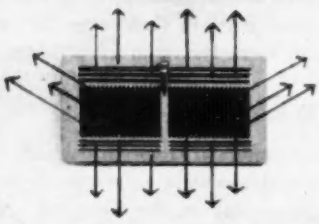
4-way diffusion for balanced air circulation



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EQUIPMENT DEVELOPMENTS

The latest information on manufacturers' developments is presented here with brief summaries of the applications of these products. For new literature giving product information which is available see page 151.

Counterflow Furnace

MODEL G-811-V gas fired winter air conditioning counterflow furnace, equipped with a "Regulaire" blower designed to automatically regulate itself to circulate heat in relation to the amount of heat there is in the furnace — Perfection Stove Co., 7609 Platt Ave., Cleveland 4. The blower eliminates hot and cold blasts of air, the company states. Rated input of the model is 95,000 Btu per hr. Specially designed for basementless homes, it may be installed in alcoves, closets, or utility rooms.

Above: Arc Welder

Left: Furnace

D-C Arc Welder

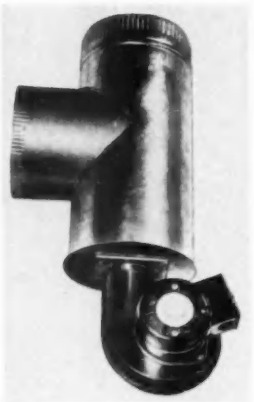
SELENIUM RECTIFIER d-c arc welder designed for reduced size and weight and increased ease of maintenance — Westinghouse Electric Corp., 401 Liberty Ave., Box 2278, Pittsburgh 30. The unit incorporates high efficiency with low no-load losses and high dependability with low maintenance (due to a minimum of moving parts), the manufacturer states. The welder incorporates a three phase, full wave selenium rectifier and a "Transactor" unit. A hand crank on top of the welder provides current control. Unit coils are aluminum, reducing coil weight by one half, the company states. Air flows vertically, from bottom to top, through the welder. Overload protection is provided. Standard sizes are 200, 300, and 400 amp.

Power Drill Attachment Cuts Metal

IMPROVED "KEY-HAK" attachment designed to fit any heavy duty ¼ in. electric or air drill or motor driven flexible shaft, for cutting directly (without a starting hole) into 20 gage or lighter sheet metal — Producers and Distributors, Inc., 714 S. 6th St., Allentown, Pa. The new outer housing is round rather than hexagonal. Drills with chuck speeds of 2000 to 3000 rpm are best suited as power units for the attachment, the company states. The in-line mechanism of the tool is intended to afford the operator complete control when cutting in any direction. Applications include work on steel sheet and plate, and cutting openings in corrugated metals. Special saw blades are available for cutting stainless steel, monel, chromoloy, bronze, copper, and other metals.

Above: Drill Attachment

Right: Induced Draft Fan



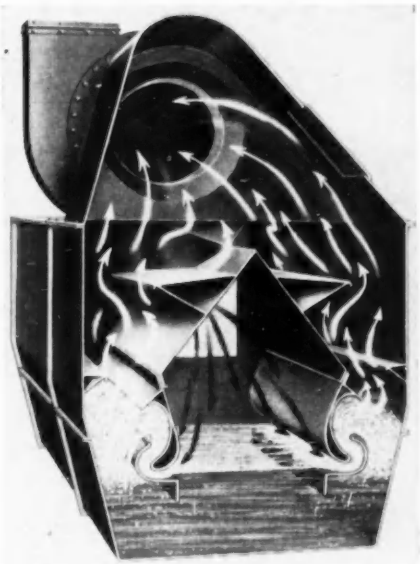
Induced Draft Fan

"CLIMATROL" INDUCED DRAFT fan designed to overcome poor chimney draft conditions which cause unsatisfactory furnace operation — L. J. Mueller Furnace Co., 2005 W. Oklahoma, Milwaukee 15. It is especially designed for use with oil burning equipment, though it may also be used with units burning gas or coal. The fan can be used on gas fired installations to overcome flue condensation problems and on coal fired equipment to eliminate puffing and sooting conditions. It is installed in the flue pipe of residential systems by inserting a common tee joint, either directly into the chimney thimble, or at any point in the flue pipe where an elbow would normally be used. The fan is mounted on either a 6 or 7 in. tee joint cap.

Dust Collector

DESIGN 4, Type N "Roto-Clone" dust collector, an improved hydrostatic precipitator that separates the dust from the air by means of an S shaped water curtain — American Air Filter Co., Inc., 355 Central Ave., Louisville, 8. This curtain is designed to collect most types of process dust. The collector is available in three basic arrangements which differ in hopper design and means of sludge removal. They provide manual cleanout, continuous drain, and sludge ejection by flight conveyors.

Among the improved features are: non-plugging water entrainment separators; a heavier sludge ejector mechanism; a wider range of sizes and capacities; and sec-



tional construction to permit field conversion from one arrangement to another. The collector is available in capacities of 1000 to 48,000 cfm.

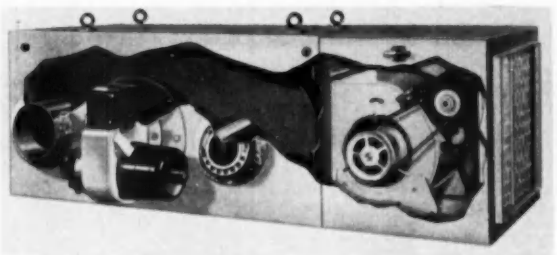
Aluminum Marquee

ALUMINUM MARQUEE designed for installation over an average 30 ft store front in four to six hours by three men—The Kawneer Co., Niles, Mich. No special tools are required for installation, the company states. All holes in the individual louvers are pre-drilled, and all parts and accessories are available as stock. The outside

trim members require cutting to fit job conditions. Three basic items form the marquee: the louvers, the trim members, and the accessories, which are a Z section, gutter, and hanger fittings adjustable for levelling. Individual louvers in lengths of 6, 8, or 10 ft are assembled off the job into panel widths of 4, 5, or 6 ft. Other variations in width are possible. The panel can be carried to the job, since a 6 x 8 ft section weighs 64 lb. Cantilevered or wall hanger supports are used for mountings. Louvers have a W shape for added strength. Individual louvers reflect the sun's heat, filter the light, allow air circulation, shed rain or snow, and channel water into drainage troughs.

Furnaces

THREE NEW MODELS in forced warm air furnaces — Williamson Heater Co., 3529 Madison Rd., Cincinnati 9. The "Flo-Warm" horizontal oil fired furnace (illustrated) is designed for basementless homes, and may be used in crawl spaces, utility rooms, or attics. Eye bolts are provided for suspension. The unit is 66½ in. wide, 25 in. deep, 22 in. high. Output rating is 84,000 Btu. The



70,000 Btu input gas counterflow furnace occupies 22¼ x 18 in. of floor space. The gas burner is the upshot, single port type and can be installed in less than 10 minutes, the company states. An orifice plug for natural gas and a blank orifice tagged with drilling instructions for different local fuel conditions are provided. A gas highboy furnace of 70,000 Btu input capacity also is offered. It occupies a little over 4 sq ft of floor space.

Direct Reading Heating Calculator

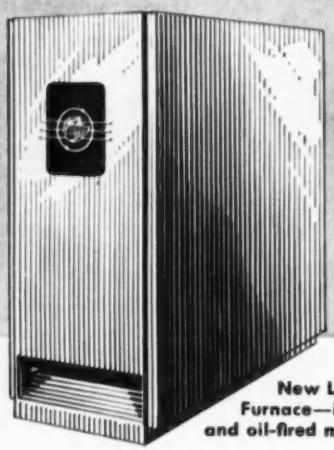
DIRECT READING Btu calculator for figuring heat losses — Paul S. Morton Engineering Services, 609 Bangor Rd., Lawrence, Mich. No interpolation is required. The calculator operates like a slide rule but reads like a table, giving the correct Btu for any area or volume under a choice of 28 factors. Either the area or volume is set under an arrow on the calculator. Then, on the same line under the desired U factor, the Btu is read directly. On the face of the calculator an example is worked out demonstrating its use. The calculator is 3¾ x 9 in. in size, and is made of vinyl plastic.

Fanner Magnet for Handling Sheets

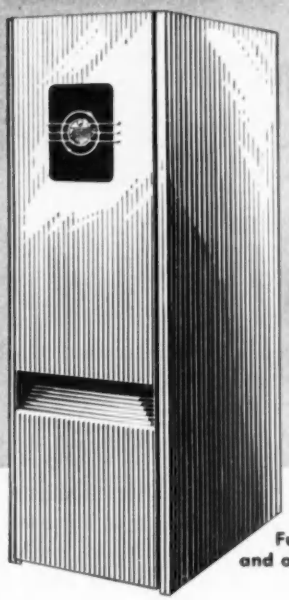
SHEET FANNER MAGNET for use in metal working shops where steel sheets are handled in piles, such as in stamping work, punch pressing, or shearing operations — Eriez Mfg. Co., 7 E. 12th St., Erie, Pa. The fanner is designed to separate oily sheets without requiring prying, lift polished or painted sheets without scratching, prevent double feed, handle irregular or odd shapes, speed up production and provide safety for operators. It is availa-

(Please turn to page 136)

4 BIG REASONS WHY YOU CAN MAKE MORE MONEY with CHRYSLER AIRTEMP!



New Lo-Boy Furnace—in gas and oil-fired models



New Hi-Boy Furnace—in gas and oil-fired models

★ All-new Chrysler Airtemp Furnaces offer your customers more efficient, more economical automatic heating through many exclusive engineering features—plus smart, modern styling which makes the furnace an attractive part of any location.

★ 8-Year Warranty on new corrugated design Chrysler Airtemp heat exchangers—an extra protection your customers will really appreciate!

★ You will find that people know and respect the Chrysler Airtemp name—associate it with engineering leadership—have full confidence in the quality of Chrysler Airtemp products.

★ Chrysler Airtemp Air Conditioners, so easy to install with the new Chrysler Airtemp Furnaces, give you the opportunity to sell any customer Year 'Round Air Conditioning* now or later—at a big extra profit to you.

Get all of the facts of today's opportunity to make more money as the Chrysler Airtemp Dealer in your area. Mail the convenient coupon now!

**Air or Water-Cooled Models*

Guaranteed by Good Housekeeping

Chrysler Airtemp

HEATING • AIR CONDITIONING

***For* HOMES, BUSINESS, INDUSTRY**

Airtemp Division, Chrysler Corporation
Dayton 1, Ohio

Airtemp Division, Chrysler Corporation **AA-10-53**
P.O. Box 1037, Dayton 1, Ohio

Please send full details about the Chrysler Airtemp proposition.

Name_____

Address_____ Phone_____

City_____ Zone____ State_____

YOU CAN GET STARTED WITH Stainless NOW!

No trick to soldering ENDURO *Stainless Steel. Use a large iron, heat it slightly more than usual. That's all.*

After soldering, wash off all flux immediately. Use a 5% to 10% solution of washing soda and water.

There's no need for you to pass up those high-profit stainless steel roof drainage jobs you've been hearing about. Berger Roof Drainage Products made of Republic ENDURO Stainless Steel are *easy to hang.*

Your usual tools and equipment . . . your own knowledge and experience fill the bill. Nothing else required.

For an all-around, stronger, more attractive, corrosion-resistant drainage system, figure on using all-ENDURO fittings and accessories, too.

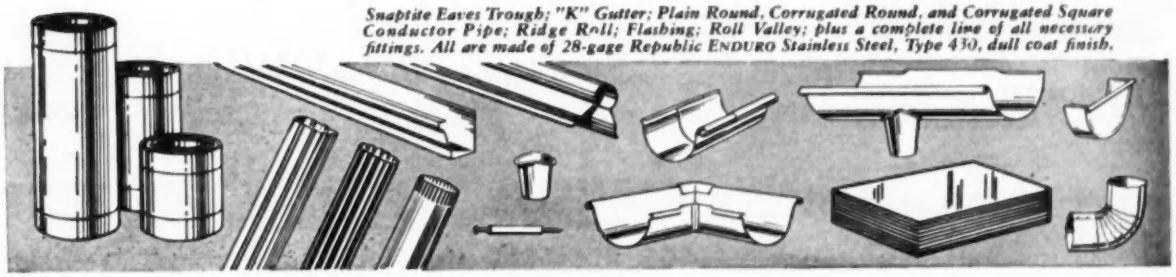
Jobs are waiting . . . and demand is expanding rapidly as home owners learn all the advantages of stainless steel. Jobbers in most areas have stocks of ready-to-use Berger ENDURO Stainless Steel Roof Drainage Products. Get started with stainless now.

BERGER MANUFACTURING DIVISION
REPUBLIC STEEL CORPORATION
1010 BELDEN AVENUE • CANTON 5, OHIO

BERGER
STAINLESS STEEL ROOF DRAINAGE PRODUCTS

REPUBLIC STEEL

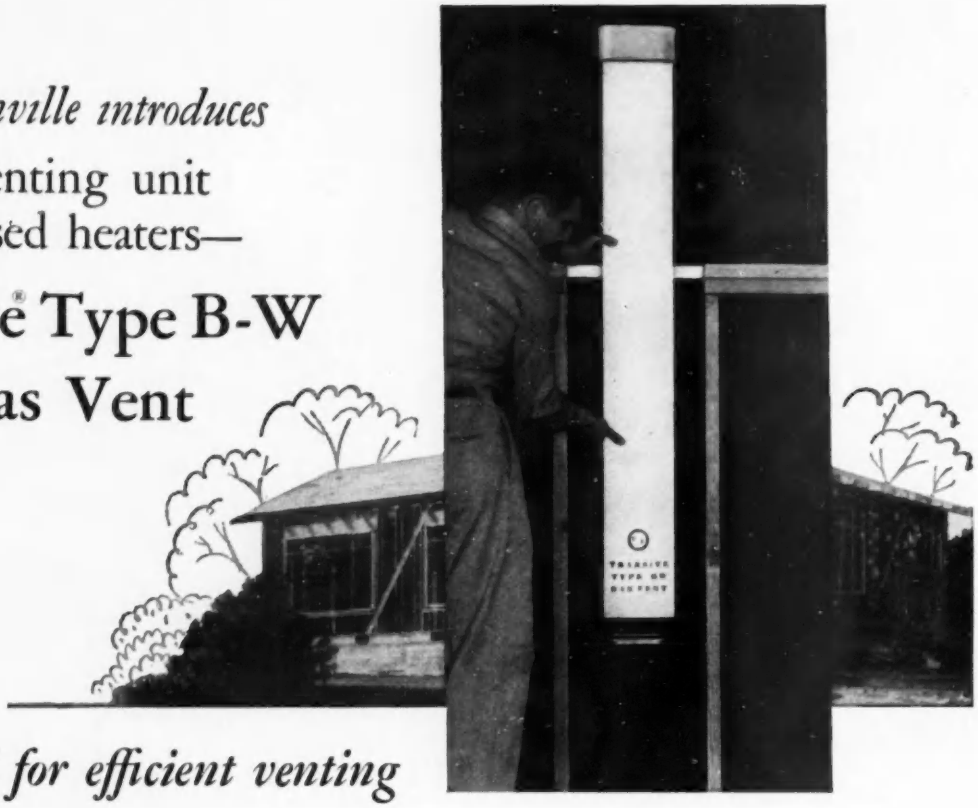
Snaptite Eaves Trough; "K" Gutter; Plain Round, Corrugated Round, and Corrugated Square Conductor Pipe; Ridge Roll; Flashing; Roll Valley; plus a complete line of all necessary fittings. All are made of 28-gage Republic ENDURO *Stainless Steel, Type 430, dull coat finish.*



Johns-Manville introduces

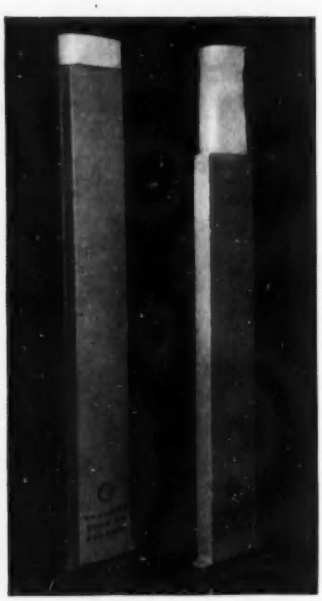
a new venting unit
for recessed heaters—

Transite® Type B-W Gas Vent



Designed for efficient venting

...for lower installed cost



The Transite Type B-W Gas Vent is available with oval bell for connection to oval pipe and fittings and with built-in, oval-to-round adaptor for round pipe and fittings

To effect important economies on installed cost . . . to improve the venting of recessed heaters, Johns-Manville has developed the new Transite Type B-W Gas Vent. This modern vent is approved by Underwriters' Laboratories, Inc. for ⅜" minimum clearance to combustible surfaces, permitting installation in standard wall construction without furring.

A Ready-to-Install, One-Piece Unit

The Transite Type B-W Gas Vent consists of an asbestos-cement oval vent pipe combined with an aluminum outer jacket. It is available with either round or oval bell end for ready connection to Transite Type B Gas Vent.

Strong, Rugged and Resilient

While light in weight so as to handle easily, Transite B-W Gas Vent is strong and resilient so that it withstands the rough treatment often encountered on the job. This resilient construction is assured by full length spacers. Transite B-W Gas Vent does not easily dent. It is incombustible and, of course, resistant to corrosion. It cannot rust.

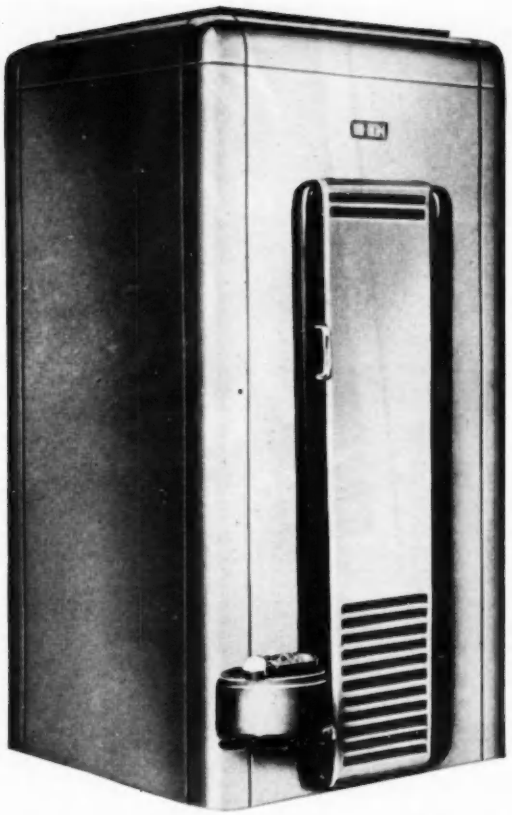
Simple and Speedy

Installation is simple and speedy; Transite B-W Gas Vent can be quickly connected to Transite Type B Gas Vent and Fittings. For further information on gas vents for Type B-W and Type B venting, see your distributor or write Johns-Manville, Box 60, New York 16, New York.

JOHNS MANVILLE JM PRODUCTS

Johns-Manville TRANSITE TYPE B-W GAS VENT

FOR RECESSED HEATERS



THE FURNACE THAT'S SAFETY-PIN SIMPLE

There's no other furnace to compare with a Duo-Therm Automatic Oil Furnace for sheer simplicity. Its foolproof design provides phenomenal performance at low cost. It simplifies every single oil furnace problem from sales and installation to service and customer satisfaction.

Trouble-free burner! Duo-Therm's exclusive Dual Chamber Burner is *all* burner. No moving parts, nozzles or power attachments to wear out or foul up. Patented air injection mixes air and oil in 6 stages for *cleaner* heat, *quieter* heat, *more* heat . . . from every drop of oil. *Oversized* in capacity—you don't have to oversize the job.

Constant heat! Duo-Therm's exclusive Comfort-Selector thermostat provides finger-tip control of the low-fire flame adjustment of Duo-Therm's flexible burner. It enables you to tailor the fire to the weather. The result is *Straight-Line Temperature Control* . . . constant, *even* heat without on-and-off discomforts.

Easier to sell and install! Duo-Therm oil furnaces are ideal for 80% of the homes being built today, and prices are terrifically competitive. A *big*-capacity Duo-Therm fits in small closet spaces and goes through doorways easily. And Duo-Therm's installation "packages" save you assembly costs.

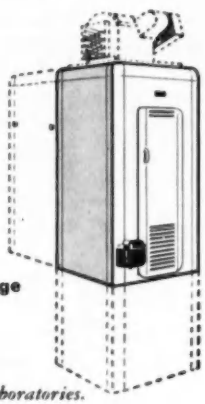
Send the coupon today for full information!

Basic Gravity Model in 2 capacities. Complete with thermostat. The industry's greatest value in an automatic home heating package. Diagram shows how simply this same basic furnace is adapted to any type of forced-air installation.

Top-Mounted Blower Package for reverse flow operation.

Rear-Mounted Blower Package for deluxe basement installation.

Underneath-Mounted Blower Package for utility rooms.



Listed as Standard by Underwriters' Laboratories.

More than 2 million warmly satisfied customers . . .

DUO-THERM

Always the Leader

Division of MOTOR WHEEL CORPORATION, Lansing 3, Michigan

—MAIL THIS TODAY—

Duo-Therm Division of Motor Wheel Corporation
Dept. AA, Lansing 3, Michigan

Please send me complete information about Duo-Therm Automatic Oil Furnaces.

Name_____

Address_____

City_____ Zone__ State_____

Specify

Nationally Advertised

DETROIT CONTROLS

Known to Millions of
Your Best Heating Prospects
Through the Powerful Pages of
BETTER HOMES & GARDENS and TIME

Yes, your best heating prospects—*over 5 million of them*—are reading regularly about dependable, economical DETROIT Heating Controls in two of America's top advertising mediums—Better Homes & Gardens and Time! These are people who have the means to buy and who know, look for and buy better things. That's why they'll want DETROIT Controls. And that's why you can step up your sales and profits by stocking DETROIT Controls. Remember, only DETROIT gives you the exclusive *Timed Cycling* thermostat—the "thermostat with a brain" that controls temperature to a fraction of a degree, eliminating over and under heating. So why not cash in on this overwhelming product superiority and the powerful advertising support that goes with it? Always be sure to ask for DETROIT Controls!

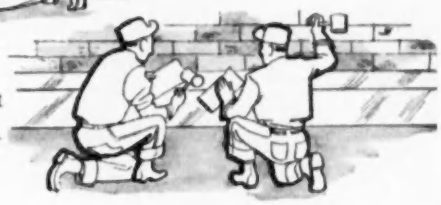
If you're not already familiar with the DETROIT *Timed Cycling* Thermostat write today for Form No. 1545-A.

DETROIT-Controls CORP.

5900 TRUMBULL AVE. • DETROIT 8, MICHIGAN
Division of American Radiator & Standard Sanitary Corporation

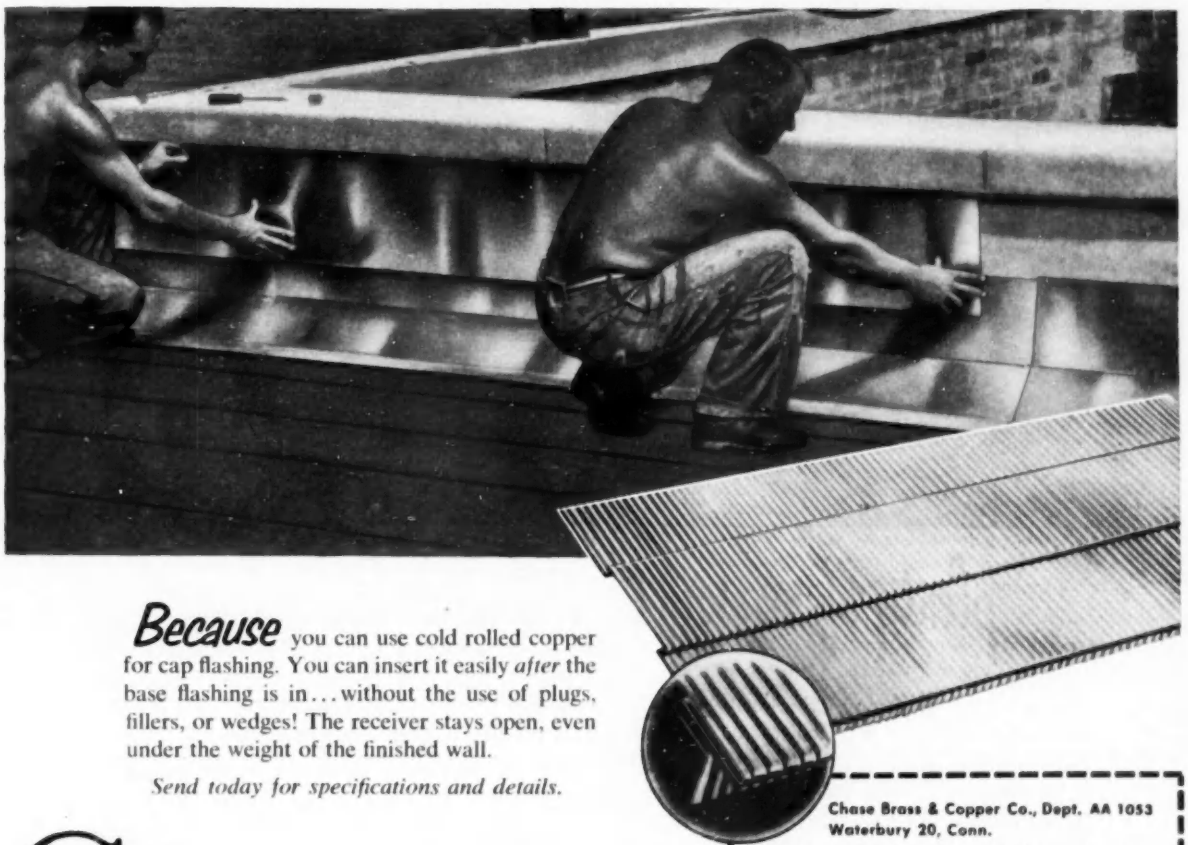
If you've ever yanked up a built-in cap flashing to get at the base flashing...

And then tried to make it lie flat without cracking at the bend...



Then you know why it's better to use the new

CHASE® one-piece thru-wall FLASHING and CAP FLASHING RECEIVER!



Because you can use cold rolled copper for cap flashing. You can insert it easily *after* the base flashing is in... without the use of plugs, fillers, or wedges! The receiver stays open, even under the weight of the finished wall.

Send today for specifications and details.

Chase Brass & Copper Co., Dept. AA 1053
Waterbury 20, Conn.

Please send me your free folder on the new Chase One-Piece Thru-Wall Copper Flashing and Cap Flashing Receiver.

Name_____

Position_____

Firm_____

Street_____

City_____ State_____

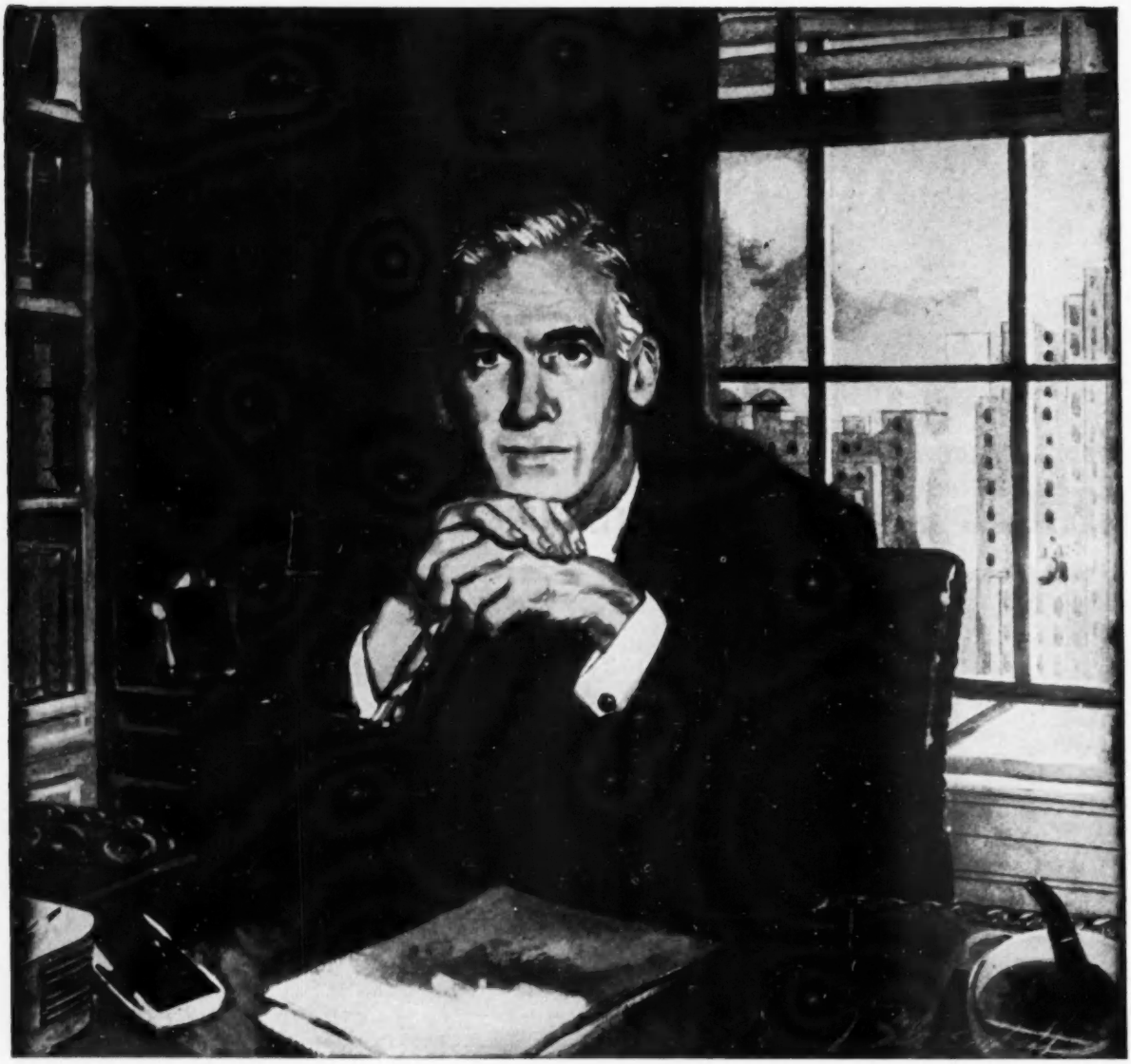
Chase® BRASS & COPPER

WATERBURY 20, CONNECTICUT • SUBSIDIARY OF KENNECOTT COPPER CORPORATION

The Nation's Headquarters for Brass & Copper

Albany† Atlanta Baltimore Boston Chicago Cincinnati Cleveland Dallas Denver† Detroit Houston Indianapolis Kansas City, Mo. Los Angeles Milwaukee Minneapolis Newark New Orleans New York Philadelphia Pittsburgh Providence Rochester† St. Louis San Francisco Seattle Waterbury

(†sales office only)



plenty of reason to set you dreaming

This is a time for planning, by business men of vision. The day must come when allocations and priorities will be words of the past . . . when materials will be much easier to get and orders perhaps much harder. Against that day, let some of your dreaming center on stainless steel, the most uniquely useful metal in the book—hard, strong, beautiful, everlasting.

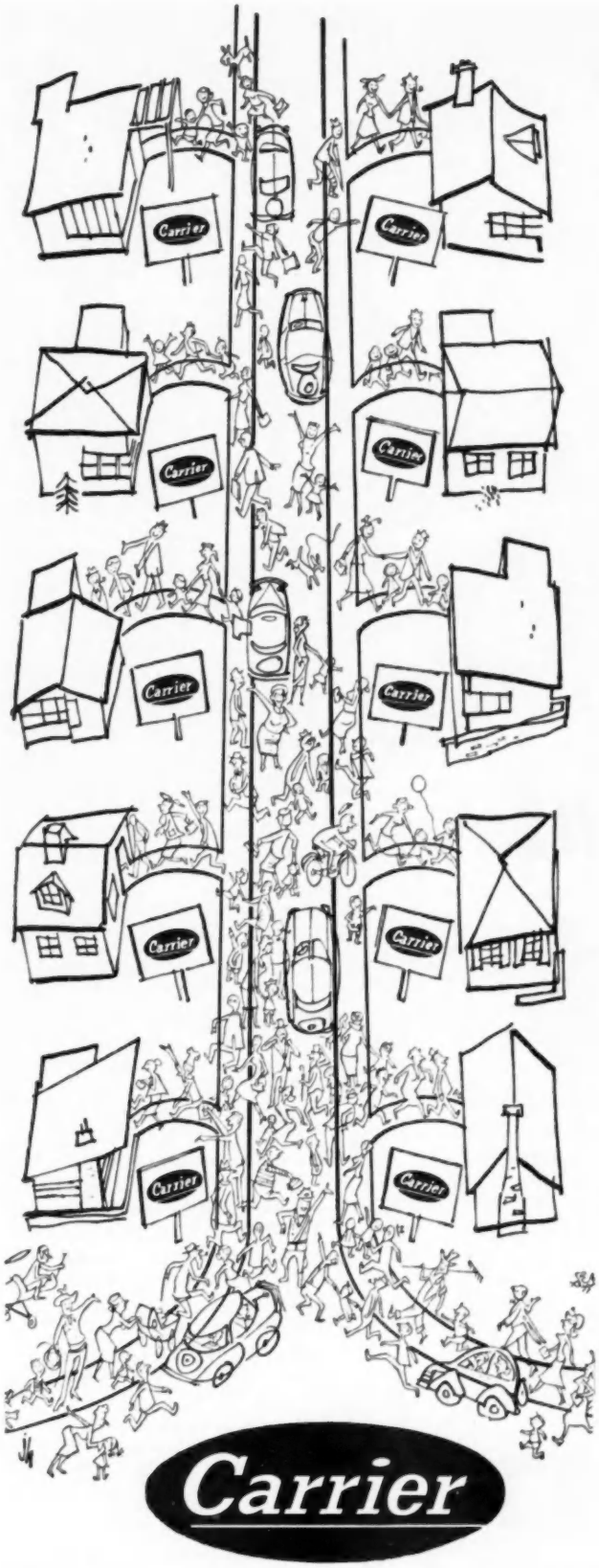
● Our Development Engineers and Research Staff are at your service. Let us work with you. ***Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.***

You can make it BETTER with

Allegheny Metal

AL
TIME-TESTED STAINLESS STEEL

WAD 4063



Get into the booming air conditioning business—with Carrier

EASY TO SELL • EASY TO INSTALL EASY TO SERVICE

Here's a real pretty picture—estimates say a million new houses will be built in '54. The majority are "hot" prospects for air conditioning. Millions of old houses *should* have air conditioning.

You ought to get in and *get your share*
The best time to start is *right now*
And the best product to sell is the Carrier Residential Weathermaker*

The Carrier Residential Weathermaker — Proved, Reliable

combination unit—heats *and* cools
simply designed for efficient and quiet operation
fired by gas or oil, cooled by water or air
operates at low cost
completely packaged for easy installation
100% serviceable from the front
saves space—occupies about 10 sq. ft.
priced right—the Weathermaker is the largest selling single-unit home air conditioner in the world

Carrier is the first name in air conditioning

Carrier has a complete line—Carrier dealers can go after any size job
Carrier backs dealers with the heaviest advertising and sales promotion activity in the industry
Carrier has more experience than any other manufacturer in the air conditioning industry—wide experience in heating, too
Carrier air conditioning serves *more* people and *more* purposes than any other make

Start *right now*—while you can still get in on the ground floor. Paste this coupon on the back of a postal card. Put it in the mail *today*.

*Reg. U. S. Pat. Off.

CARRIER CORPORATION
308 S. Geddes Street, Syracuse, New York

I want to sell the Carrier Weathermaker. Please have your local distributor get in touch with me as soon as possible.

Name _____

Street _____

City _____ *Zone* ____ *State* _____

Carrier

AIR CONDITIONING REFRIGERATION INDUSTRIAL HEATING

Once is not enough!

The need for blood is greater than ever, not only for men wounded in combat, but here at home . . . to cure disease, to meet accidents and disasters, and to prepare for civil defense.

Our quota can ONLY be met, if those who give *keep on* giving . . . regularly!

You CAN give more than once . . . as often as every three months with complete personal safety. The more often you give the more often you save a life. For every pint of blood you give goes to someone who needs it desperately.

Remember . . . once is NOT enough. Give blood again and again! Call your Red Cross, Armed Forces or Community Blood Donor Center for an appointment to give blood today.

GIVE BLOOD

...give it again and again

BUSINESS EXECUTIVES!

CHECK THESE QUESTIONS

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ◯ HAVE YOU GIVEN YOUR EMPLOYEES TIME OFF TO MAKE BLOOD DONATIONS?
- ◯ HAS YOUR COMPANY GIVEN ANY RECOGNITION TO DONORS?
- ◯ DO YOU HAVE A BLOOD DONOR HONOR ROLL IN YOUR COMPANY?
- ◯ HAVE YOU ARRANGED TO HAVE A BLOOD-MOBILE MAKE REGULAR VISITS?
- ◯ HAS YOUR MANAGEMENT ENDORSED THE LOCAL BLOOD DONOR PROGRAM?
- ◯ HAVE YOU INFORMED EMPLOYEES OF YOUR COMPANY'S PLAN OF CO-OPERATION?
- ◯ WAS THIS INFORMATION GIVEN THROUGH PLAN BULLETIN OR HOUSE MAGAZINE?
- ◯ HAVE YOU CONDUCTED A DONOR PLEDGE CAMPAIGN IN YOUR COMPANY?
- ◯ HAVE YOU SET UP A LIST OF VOLUNTEERS SO THAT EFFICIENT PLANS CAN BE MADE FOR SCHEDULING DONORS?

Remember, as long as a single pint of blood may mean the difference between life and death for any American . . . the need for blood is urgent!

NATIONAL BLOOD PROGRAM

GET THE FACTS... see why

more and more appliance makers choose

PACKARD ELECTRIC MOTORS

The makers of motor-powered products gain in *three ways* when they choose Packard Electric motors specially adapted for use with their products.

First: Manufacturers get the *right* motors for *their* products . . . motors that fit the space, provide correct starting and operating torques, and have the proper construction for long service.

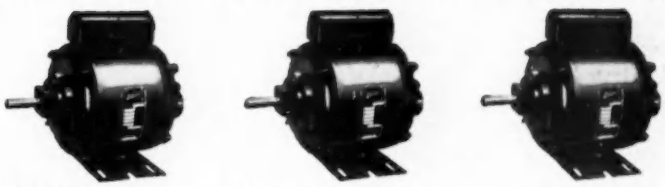
Second: Packard Electric motors are so dependable they help keep customers satisfied, help reduce complaints and servicing, and actually help increase product sales.

Third: Manufacturers get these specially engineered motors at low cost . . . due to Packard Electric's tremendous facilities for volume production.

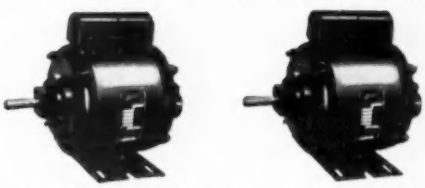
So, if you have any motor problem, call on Packard Electric. Let Packard's engineers show you how you can gain with Packard Electric motors.

FOR:

DISPOSAL UNITS • DRYERS • IRONERS • WASHERS • STOKERS • LAWN MOWERS



VENTILATING UNITS • MILKING MACHINES • CREAM SEPARATORS



BLOWERS • OIL BURNERS • COMPRESSORS • WATER PUMPS • BENCH TOOLS

DEPENDABLE APPLIANCE MOTORS FOR THIRTY-SIX YEARS

GM GENERAL MOTORS

Packard

REG. U.S. PAT. OFF. TRADE MARK

Packard Electric Division
General Motors Corporation
Warren, Ohio

RESTAURANT KITCHEN —

(Continued from page 61)

night, after washing. In preparation for a meal, the cart is wheeled around the dining room, and trays of tableware removed and left at convenient spots around the room for the waitresses to use.

Pot Sink Custom Built

Typical of the more complex items custom built to fit the 16th floor kitchen is the pot sink. This has a base of 1¼ in. stainless steel pipe, made in detachable assemblies. Uprights for the overhead shelf are of 1⅝ in. stainless tubing, fastening to supports on the legs and passing through die-cut holes in the rear ledge of the drainboards.

The sink compartments and drainboard are of 14 gage stainless steel sheet, rolled down on front and sides, with a 5 in. ledge with die-crimped edge in back. In the center of the sink is a 6 in. wide grease compartment with removable stainless steel grease box. Supported by stainless steel gussets is an overhead shelf of 14 gage stainless steel turned up on both ends and in the rear, and rolled down on all edges. As in the other fixtures, all working edges on this unit have been highlighted.

Wall Cabinets Have Sloping Tops

Above the 16th floor pantry working surfaces are hung four specially designed stainless steel wall cabinets (Fig. 4). Among other features these cabinets have tops which slant down from the wall toward the cabinet front. This makes the tops visible, so dirt cannot accumulate unnoticed and can be easily removed.

The cabinets are made of 18 gage stainless steel sheet throughout. All exposed vertical and horizontal corners are curved on ⅝ in. radius, and highly polished. Two fabricated channels are welded to the back of each cabinet for attaching to the wall.

Doors are double-wall, stainless steel inside and out, with sound-deadening insulation in between.

Stove Canopy of Stainless Steel

Another major item fabricated for the 16th floor kitchen is a huge stove canopy (Fig. 5). This is more than 14 ft long, 7 ft deep, and extends about 2 ft below the suspended ceiling.

The canopy is built on a frame of 1½ x 1½ x ⅛ in. angle iron, hung from angles attached to the under side of the concrete 17th floor. All exterior surfaces are panels of 18 gage stainless sheet, held in place by 14 gage stainless steel bars 2 in. wide, with concealed bolt head construction. Inside the hood, the construction is also of stainless steel, 16 gage sheet forming the bottom of the plenum chamber and the frame supporting the grease filters, with 14 gage sheet formed into grease troughs and gutters.

Where there is a trim strip, or a field joint, the fabricators have fastened the sheet by means of stainless steel lugs welded to the under side of the sheet. These threaded lugs permit pulling the sheet up tight to the inside framework without any bolt or screw heads showing on the exterior.

As in all the equipment which Southern Equipment Co. fabricated for this job, Type 430 sheet was used with a No. 2 mill finish. This was given additional polish by the company, and all trim, such as the exterior edge of the grease gutters and the bars holding the external panels in place, is highlighted with an even brighter degree of polish, forming a contrast in appearance.

Though normally this equipment would have been fabricated from 18-8 stainless steel, the currently more readily available Type 430 steel was used. Welding and fabricating of this steel was accomplished in substantially the same manner as would have been used with 18-8. Welds were highly polished so that they would not be readily detectable. Type 430 stainless steel has been found satisfactory in these applications as a replacement for 18-8, in terms of ease of cleaning and resistance to corrosion and attack by food chemicals.

WASHINGTON LETTER —

(Continued from page 46)

the character of the water is such as to cause corrosion, scaling or obstruction of the piping, suitable water treatment device shall be installed.

Statement of Intent Required

"*Statement regarding intent*: The following shall appear in the contract specifications: It is the intent of the drawings and specifications to provide for the installation of an air conditioning system that is safe, quiet and economical in operation, complete in all respects, and which will provide uniform temperature and relative humidity in the living spaces as specified when the outside dry and wet bulb temperatures are as specified. All materials and equipment necessary to accomplish this purpose in accordance with the following conditions shall be furnished and installed by the contractor: (Space is then provided for designating outside design dry and wet bulb temperatures; inside dry bulb temperature; relative humidity, per cent; heat gain at a peak time of day; cfm of conditioned air provided under normal operating conditions, and external static pressure of the duct system; air temperature before and after passing over cooling coils; capacity of equipment; sensible heat load; latent heat load; the hp of the cooling unit, motor rpm, and ampere input to each motor; total hp; automatic or thermostatic control; and manufacturer's name and type and location of the equipment.)

"*Warranty*: Warranty of the equipment by the manufacturer shall be required, and equipment shall be guaranteed against defects for a period of one year from the date of completion and acceptance of the installation. Replacement parts shall be furnished and installed without charge during that period."

Peerless Blowers Build Fall and Winter Profits . . .

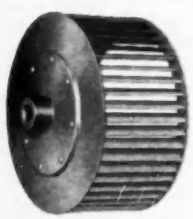
DIRECT DRIVE BLOWER

Powered by premium-built, job-matched Peerless motors from 1/6 to 2 HP for general exhaust and ventilation where large volumes of air at economical cost is important. Housing can be set in eight different positions for discharge at any angle. Each unit registered and guaranteed.

BELT DRIVE UTILITY BLOWER

Matched with Peerless Electric Motor. From 1/6 to 7-1/2 HP. Housings are convertible. Blowers for counterclockwise rotation furnished as specified. Arc-welded frames and housings. All units have Peerless registration and guarantee.

Wheels 18" in diameter and larger are welded. Sizes 27" have three tie-rods for extra rigidity. Wheels dynamically balanced.



On blowers 15" in diameter and smaller . . . riveted construction . . . dynamically balanced . . . vibration-free operation at high speeds.

This is the season when closed doors create smoke, fumes and stale air conditions . . . people want belt and direct drive blowers that will solve the problem . . . sell them the Peerless line for quick and long-term profits.

Mr. Distributor and Mr. Dealer —

Check the Peerless "sales-plusses" . . . complete, ready-to-install units . . . Peerless Guarantee . . . Peerless Registration . . . Peerless Rugged Motors . . . one supplier!

Add Peerless Blowers' heavy-duty, arc-welded housings . . . job-matched motors . . . rigidly engineered construction . . . features that put an end to expensive call-backs!

Use Peerless engineering service with your own sales knowledge to sell those tough middle-sized jobs.

Compare Peerless' competitive prices and you'll see why it's to your direct advantage to sell Peerless Blowers.

Put those Peerless "sales-plusses" together and they spell just one thing for you . . . P-R-O-F-I-T-S . . . PROFITS!

If you have a fan or blower job that needs immediate attention, call Peerless and ask for the Fan and Blower Division. Wholesalers and dealers are delighted with Peerless service policy, products and the prices!

"SMOOTHEST PERFORMERS ON THE MARKET"

FAN AND BLOWER DIVISION

THE PEERLESS ELECTRIC COMPANY

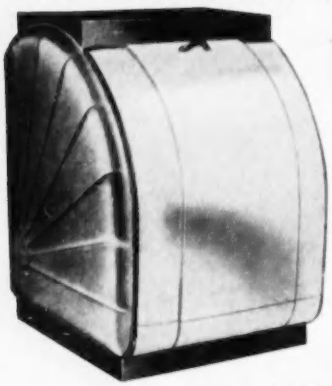
1405 WEST MARKET ST. · WARREN, OHIO

Peerless Electric

"Viking BLOWER PACKAGES

Featuring:

Exclusive Labor-Saving Installation!
Quiet-Efficient Operation!
Attractive Streamlined Styling!



Really Make A Hit

With My Cleveland Distributors and Dealers."

says Genial Tom McIntyre, Viking Representative in Western Pennsylvania and Central Ohio

"Viking's Salability Has Increased My Blower Profits Tremendously"

"Easier wiring, easier motor mounting, lots of room to work inside—these are some of the things that make my dealers like Viking Blowers because they permit more profitable one-man installation. And when my dealers like Viking, you can be sure I do, too."

JOSEPH J. SMOLIK
The Furnace & Boiler Parts Co.
4517 Broadway, Cleveland, Ohio

Cleveland Dealers agree—

Viking

BLOWER PACKAGES are sure to meet all consumer demands!

"I'd say that the streamlined Viking '400' is the best looking blower on the market. And I've found that smart styling is what it takes to sell the housewife. They especially like the way the '400' saves space and improves looks."

LADDIE J. HOLUB, Dombrady Furnace Co.
7609 Traymore Ave., Cleveland 9, Ohio

"There aren't many blowers as jam-packed with quality features as a Viking. That snap-out filter ledge lets me get into the cabinet and do the job in a hurry. And as for quietness—Viking Blowers are so quiet my customers forget they're operating."

BUD COOPER, Cooper Heating and Air Conditioning Co.
4610 Clark Ave., Cleveland, Ohio

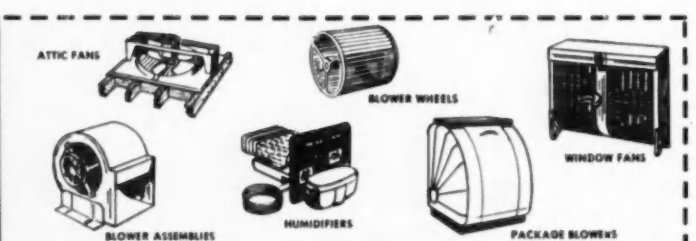
"I like Viking Blower Packages because I can save 45 minutes on each installation. Being able to wire the motor outside the cabinet and set it in, motor mount and all, is what does the trick. I can't help making more money on Viking installations."

E. J. LESIAK, General Heating Co., Inc.
7030 Wade Park Ave., Cleveland, Ohio

Viking

AIR CONDITIONING CORP.

Cleveland 2, Ohio



heating accessories help you make

Automatic Profits

from every oil space heater sale

Win 2 big markets with these sales-proved controls

New customers, about to buy an oil space heater. Old customers, too. They're both hot prospects for dependable A-P automatic heating accessories. Proof... more than 10,000,000 A-P manual control valves are now in use — and hundreds of these, right in your own neighborhood, *mean automatic sales and automatic profit for you!* Learn more about these fast-selling items. Write today for complete information.

Because of A-P's nationwide service stations, you'll have no service problems.

243 SY Trapit

Traps dirt and condensation in oil before it can reach burner and choke flame. A perfect water trap. Lifetime monel-metal screen — never needs replacement. A must for all oil-burning equipment with remote tanks.

A-P Oilifter

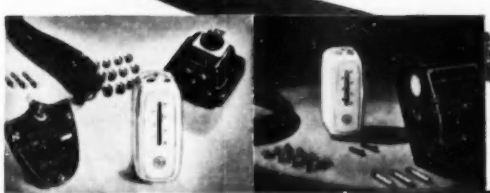
Automatically lifts oil from storage tank to burner. Eliminates *all* oil handling in the home. Pumps fuel from outside or basement tank to heater above, as high as 25 feet.

240MT-YS Thermomatic Comfort Control

Provides comfort of even, automatically controlled heat. Easily installed. No electrical connections. Can be used with most space heaters equipped with A-P manual control valve.

Retails at Only $12.95*

**In Canada, $14.50 including Canadian Tax*



Thermostatic Comfort Control Kits

K-240 ED. Electric room thermostat heat regulation for oil heaters with one or two burners.

K-240 ETS. Automatic room-thermostat control for oil heaters with circulating fan or draft blower.

DEPENDABLE *Controls*

For Liquids • Air • Gases • Refrigerants

A-P CONTROLS CORPORATION

2452 North 32nd Street, Milwaukee 45, Wis.
In Canada: A-P Controls Corp., Ltd., Cooksville, Ont.

For Export: 13 East 40th Street, New York 16, New York, U.S.A.

EQUIPMENT DEVELOPMENTS —

(Continued from page 121)

ble in four strengths and three sizes (6, 9, and 12 in.) and will handle light sheets from 22 gage to ¼ in. plates. The magnets are non-electric.

Magnet

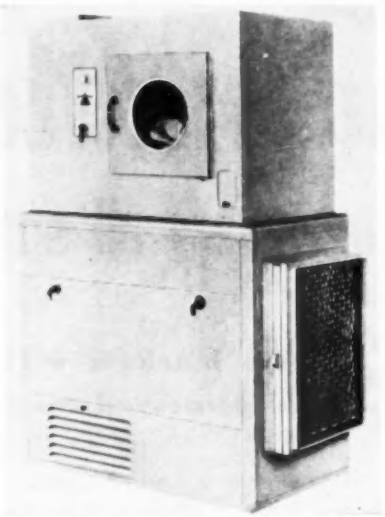
Fan

Ventilating Fan

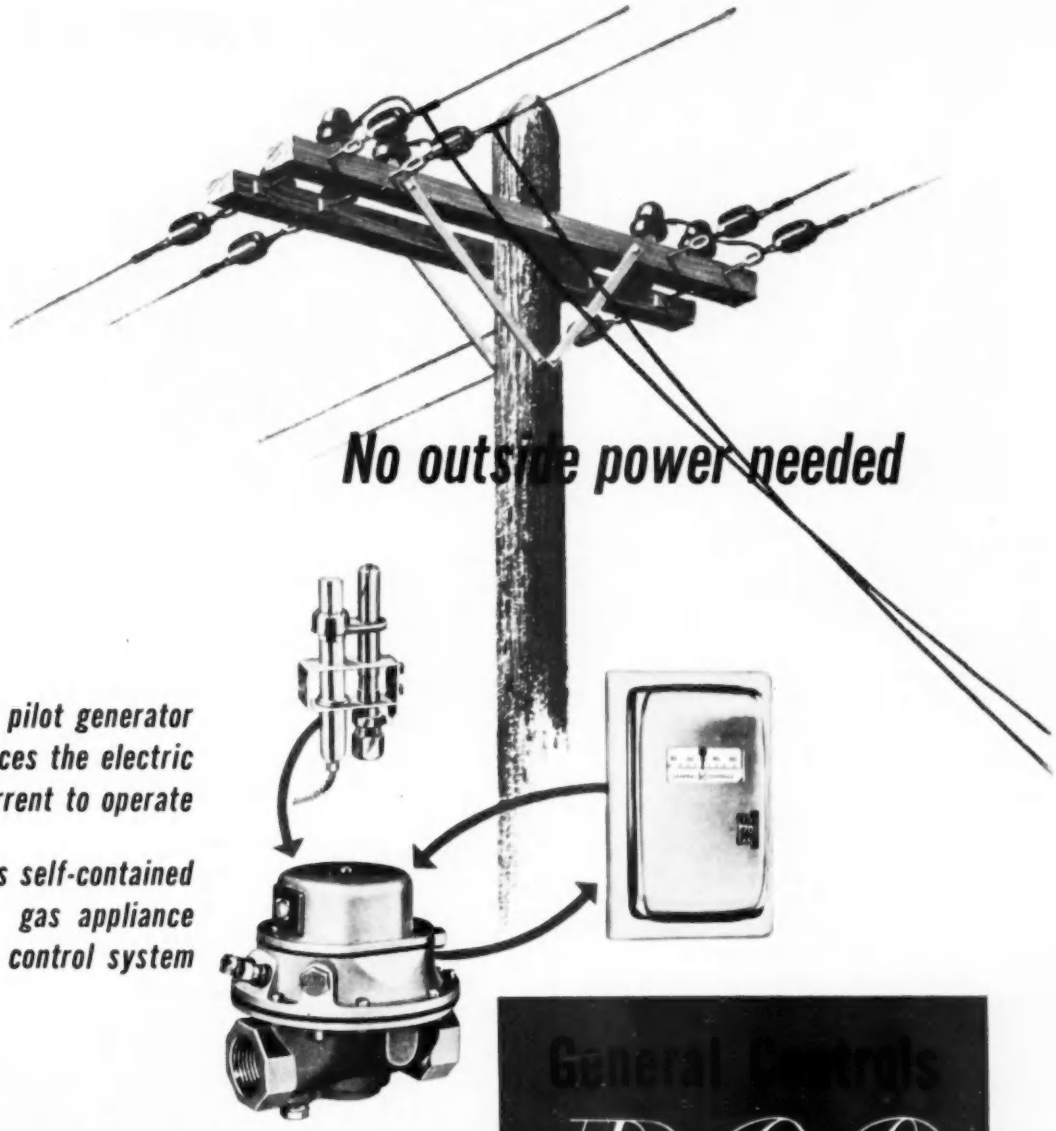
"TWIN-BLOWER" ventilating fan for installation in kitchen cabinets or ceilings — NuTone, Inc., Madison and Red Bank Rds., Cincinnati 27. With the special assembly, one motion releases all parts for cleaning. No tools are required. The fan housing measures 8 x 8 x 14 in.

Combination Furnace and Clothes Dryer

COMBINATION forced warm air furnace and clothes dryer — Herbster Products Co., 5309 Euclid Ave., Cleveland 3. The waist-high furnace is gas fired, AGA approved, and rated at 76,000 Btu output at the bonnet. The clothes dryer is mounted on top. Moveable baffles in the discharge passage can be set to deflect all or part of the



heated air over into the dryer. For drying, clothes are placed in the drum basket and the operating knobs are set. Clothes are blown dry by a flow of filtered air at 170 F. Settings are provided so that in the winter, warm air can be fed to both the house and the dryer. In summer, warm air enters only the drying chamber.



No outside power needed

pilot generator produces the electric current to operate

this self-contained gas appliance control system

"Self-operated"—that's General Controls' B-60 all-gas temperature control system, providing automatic control over gas-fired appliances without the use of outside power. The Pilot Generator develops electrical energy to operate the system, creating up to 700 millivolts of current by means of multiple thermocouples heated in a pilot flame. This is the only power used to operate the gas control valve controlling the flow of fuel to the main burner at the demand of a room thermostat. For "self operation" home comfort, regardless of power failures, floods or freezes, you can rely on the General Controls B-60 all-gas control system.

GENERAL CONTROLS

Glendale, California • Skokie, Illinois

Manufacturers of Automatic Pressure, Temperature, Level and Flow Controls for Heating, Home Appliances, Refrigeration, Industrial and Aircraft Applications.

FACTORY BRANCHES IN 35 PRINCIPAL CITIES

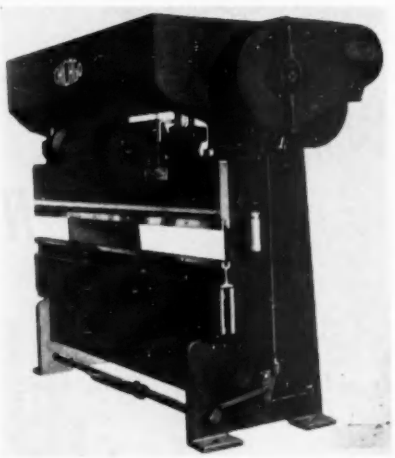
See your classified telephone directory.

General Controls Heating Controls Catalog 53H . . . a comprehensive, easy-to-understand summary of 76 automatic heating controls—the most complete line available today. Send for your copy. No charge, of course.

equipment developments . . .

Light Duty Press Brake

SERIES A light duty press brake for bending and forming sheet metal and steel plate — Dreis & Krump Mfg. Co., 7400 S. Loomis Blvd., Chicago 36. It features variable speed drive for increased production, welded plate construction for precision alignment, and a twin plate bed for



lateral rigidity, minimum deflection and a 1¼ in. slug clearance on multiple punching, the company states. The drive speed is infinitely variable between 20 to 50 strokes per minute. Three sizes are offered, in capacities of 54 in., 10 gage to 120 in., 16 gage. Each size has a 3 in. stroke, 3 in. ram adjustment, 12 in. die space, and the variable speed drive.

Registers

RECIRCULATING REGISTER designed for installation on, or adjacent to, outside walls of rooms — Radiant-Aire Corp., Arthur St., Michigan City, Ind. It is intended for use with any type of forced air system, and can be used in old or new home installations. As the register is out-of-the-wall, it can be installed after flooring and plastering are done. In operation, the register removes cold air from the floors, heats it in the register, mixes it with heated air from the furnace, and discharges it to the room in an upward direction adjacent to the wall. Connection can be made either to the back or bottom for second floor installations.

Combination Water and Space Heater

"WATER-AIR" automatic gas water heater and space heater — Handley-Brown Heater Co., 2501 Brooklyn Rd., Jackson, Mich. The unit is AGA approved for use with all types of gases. Air travels around the entire tank from the bottom air inlet to the tank top. The tank heated air is then blower driven down through the internal flue to the heat exchanger, located directly over the 25,000 Btu burner. The heated air is expelled at over 120 cfm. This reverse air flow principle stops standby heat loss, the company states. The balancing of room air

3 profit-packed words

QUALITY... COMPETITIVELY PRICED

new, project-type furnaces, easy to sell and install!

Here are the warm air furnaces dealers demanded . . . sized and designed for the new small homes... Williamson Quality *and* Priced Right! Pre-wired and pre-assembled packaged units, ready to install in 10 minutes, are so compact they're shipped in one large and one small crate.

Specifically designed for 1" clearance on sides and rear, the entire furnace can be easily serviced from the front. Counterflow unit is only 22¼" wide, 18" deep and 72" high. Hi-Boy model is 22¼" wide, 27" deep and 65" high.

See 'em and be sold . . . see how easily they'll sell. For details, mail the coupon below today.

THE WILLIAMSON HEATER COMPANY

WILLIAMSON Summer Air Conditioners

Williamson two and three ton companion summer air conditioners offer the dealer a double profit. The hermetically sealed compressor unit, warranted for five years, can be easily removed from the cabinet by one man. Write today for further information.

THE WILLIAMSON HEATER COMPANY
3529 Madison Road Cincinnati 9, Ohio

GENTLEMEN: ***Please send complete details on:***
( ) New project-type furnaces ( ) Companion air conditioners

name _____ title _____

firm _____

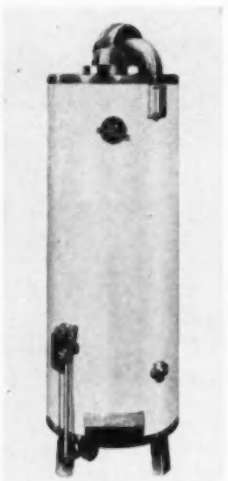
street _____

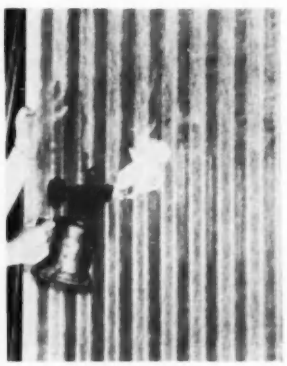
city _____ zone _____ state _____

signature _____

equipment developments . . .

thermostat and water temperature control guarantees heated air delivery, day or night, regardless of hot water drawoff, according to the manufacturer. The unit is 66 in. high, 20 in. in diameter, with a 30 gal water capacity.





Above: Panel

Left: Water-Space Heater

Fire Resistant Fiber Glass Panels

MODEL 200-FR self-extinguishing fire resistant translucent fiber glass panels designed for installation in critical fire areas — Alsynite Co. of America, 4654 DeSoto St., San Diego. It is made with recently developed self-extinguishing resins. The panel resists fire while maintaining adequate color stability, the company states. It is available in standard corrugations and flat sheets. Uses include skylights, partitions, awnings, etc.

Schoolroom Heating

HEATING AND ventilating system for individual schoolrooms, incorporating the "Southerner" principle of forced air gas heat — Norman Products Co., 1150 Chesapeake Ave., Columbus 15. The heater is installed along bookshelves or under the window on the outside walls of the schoolroom or library so that it takes up no space in the room. Preheated outside air mixes with the room air as it passes through the heater. Flow of air can be adjusted with a damper control. Circulation of warm air eliminates cold spots in front of windows, the company states. The heater is AGA-approved for use with natural, mixed, manufactured, or LP gases, with a capacity of 60,000 Btu input per hr.

Edge Type Fuel Oil Filter

EDGE TYPE plate filter designed for use with the Model CF closed flame gas-oil burner — Eclipse Fuel Engineering Co., 1017 Buchanan St., Rockford, Ill. It is intended to separate all solids from fuel oils quickly, without stopping oil flow. Filtration is accomplished by passing the oil between discs of metal, separated by spacers of the correct thickness for the particular oil to

Faster, easier ventilating duct installation with the Model 450 REMINGTON STUD DRIVER

8 Stud Drivers speed fastening of 500,000 linear feet to concrete at medical center

Hanging ventilating ducts in the University of Minnesota's new Mayo Memorial Medical Center turned out to be easier than expected—thanks to the Remington Stud Driver. Eight of these cartridge-powered tools anchored 500,000 linear feet of ductwork to concrete in a fraction of the time normally required. Complete freedom from wires and hose, plus the tool's light weight, made overhead work easier, less tiring for workmen.

So successful were the Remington Stud Drivers in hanging ductwork that other jobs were quickly found for them. In fastening angle iron for fan housings, they set up to 5 studs per minute . . . cut time and fatigue on the job to a minimum. And the tool's compact size made it a "natural" for securing grille plates in confined spaces. Workmen used the right Remington 32 caliber power loads for each job, assuring correct penetration in all cases. Over 30,000 studs were set—each one arrow-straight!

WHAT'S YOUR FASTENING JOB? Your local distributor will be glad to show you the Remington Stud Driver in action on concrete, brick or steel. Find out how *you* can cut construction costs and speed fastening jobs. For the name of the distributor nearest you, and for full information about this modern fastening system, send in the coupon below.

Now . . . even greater savings for you. Prices reduced up to 18% on Remington Studs!

"If It's Remington—It's Right!"

Remington DUPONT

Listed & Approved by Underwriters' Laboratories, Inc.

MAIL THIS COUPON TODAY

Industrial Sales Division, Dept. AA-16
Remington Arms Company, Inc.
939 Barnum Ave., Bridgeport 2, Conn.

Please send me *free* copies of the new booklets showing how I can cut my fastening costs — and the name of the distributor nearest me.

*Name*_____

*Position*_____

*Firm*_____

*Address*_____

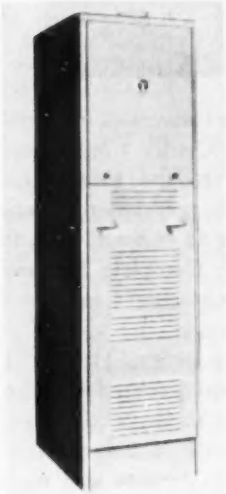
*City*_____ *State*_____

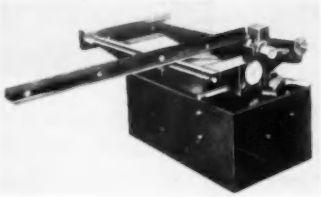
equipment developments . . .

be used. Solids larger than the spaces cling to the edges of the discs. The center space within the discs is connected to the filter outlet. Solids accumulating on the cartridge are removed when the handle operating the cleaner blade is turned.

Counterflow Furnace

MODEL 3205 gas fired counterflow furnace available in 80,000 and 100,000 Btu input sizes — Rheem Mfg. Co., 570 Lexington Ave., New York 22. Features include enclosed controls, a built-in draft diverter, top venting, AGA approved zero clearance, and sufficient space in the bottom of the furnace for installation of an automatic humidifier.





Above: Power Unit

Left: Furnace

Portable Power Unit for Slitters

POWER UNIT for independent use with slitting attachments — Lockformer Co., 4615 W. Roosevelt Rd., Chicago 50. It will power the company's Models 20-22 and 24 attachments. The attachments plus the power unit are portable. The motor is a ¼ hp capacitor type.

Gas Water Heaters

GAS WATER HEATERS for use with natural, manufactured or LP gas, and in 20, 30, and 40 gal models — Perfection Stove Co., 7609 Platt Ave., Cleveland 4. A safety control automatically shuts off all gas if the pilot flame is extinguished. The steel tank is protected against corrosion by a magnesium alloy rod and is pressure tested to 350 lb per sq in.

Power Squaring Shears

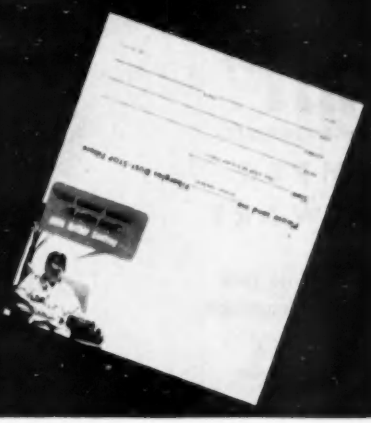
TWO NEW power squaring shears designed for the accurate reproduction of squared blanks — The Peck, Stow & Wilcox Co., Center St., Southington, Conn. Models include a 12 gage under-driven 4 ft capacity unit and a 14 gage underdriven 6 ft capacity unit. Precision cut screws are mounted in needle bearings at both ends of

"Here are 3 ways you can sell more DUST-STOP filters"

...Arthur Godfrey

People appreciate a reminder to buy something they really need. Keep your DUST-STOP Filter display in a prominent place, and make extra sales and profits.

Mail those DUST-STOP double post cards or stuffers to your customers. It's an easy way to get extra business.



If you keep a record of people who buy filters, call them on the phone during your slack hours. You'll be surprised how much DUST-STOP business you can pick up.

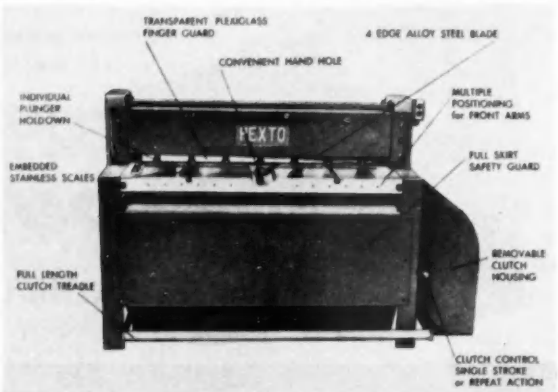
Arthur Godfrey is telling your customers the DUST-STOP* Filter story . . . forcefully and often. Your part of the job is to ask for their orders.

Fiberglas* presents ARTHUR GODFREY coast to coast on CBS

* FIBERGLAS and DUST-STOP are trade-marks of Owens-Corning Fiberglas Corporation for products made of or with fibers of glass.

equipment developments . . .

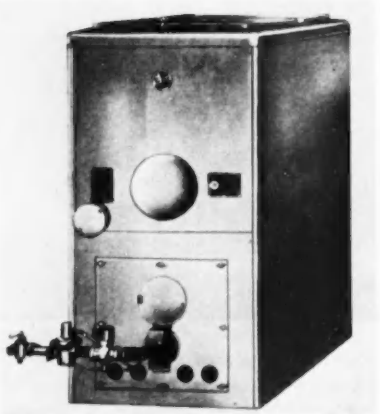
the back gage, and gage brackets travel in hand scraped ways. A front operated dial reading back gage is optional. The handwheel operates from the front of the



shear. Four matched V belts drive the flywheel from a 3 hp motor. The clutch can be changed from repeat to non-repeat without the use of tools. Close setting at the cutting edges of the four knives is held while proper face clearance is developed as the shear stroke progresses past the point of cut, a feature important in shearing stainless steel, the manufacturer states. For cutting to a line, there is full visibility directly over the edge of the lower blade as well as through the plexiglass finger guard.

Convertible Gas-Oil Furnace

MODEL TP-70 convertible gas or oil furnace with a bonnet output of 80,000 Btu — Thermo-Products, Inc., North Judson, Ind. The basement unit (illustrated) is arranged for gas firing. Its dimensions are 25 x 40⅜ x 47 in. high. A standard drawer assembly for oil firing replaces the gas burning equipment. A cover is available to conceal the controls for either type of fuel. The furnace also is available as a standard highboy and as a counterflow unit.



Prefabricated Evaporator Coil Assembly

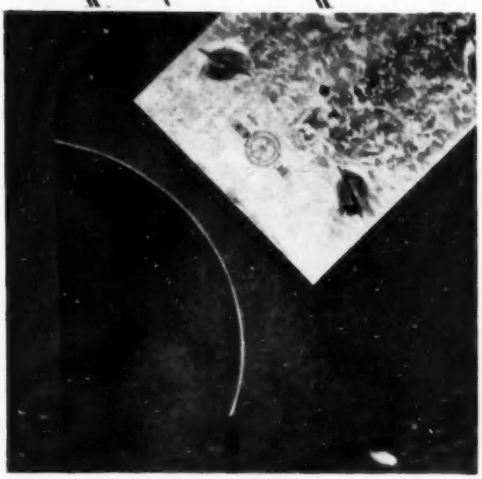
PREFABRICATED EVAPORATOR coil assembly designed to speed installation of 2 and 3 hp air and water cooled air conditioning systems — Airtemp Div., Chrysler Corp.,

When making AIR TURNING VANES Save Time and Money with...

"DURO VANE RAIL"

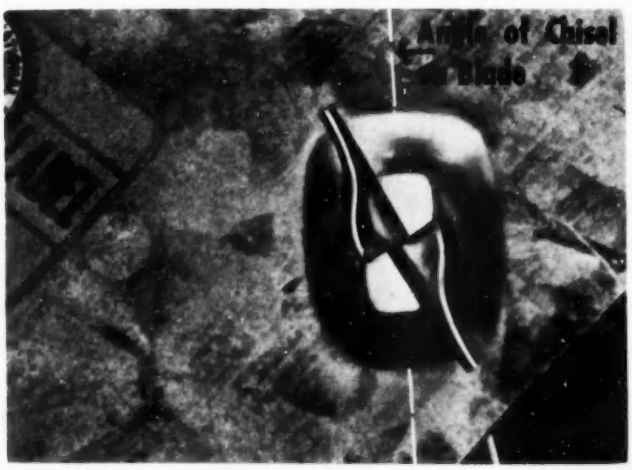
Trade Mark

New, Quick, Accurate way to make Air Turning Vanes...*Here are the 3 easy steps*

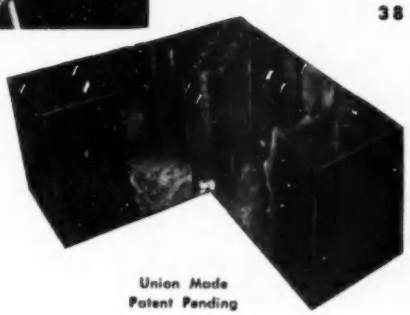


1 Shear Vanes from scrap. NO TABS. Roll to form approximately a quarter circle arc. Position Vane in the "slots" in the "Duro-Vane-Rail". Slots force Vane to take the correct curve.

2 Place chisel at angle designated. One hammer blow on chisel cuts and bends protruding part of the Vane in the "slot" to form a rigid, permanent lock, (Duro-Lock).



3 Note how, with one blow on chisel, part of Vane protruding into "slot" has simultaneously ben cut and folded over to form permanent, rigid lock. NO RATTLE. When Vanes have been secured to top and bottom "Rails," simply fasten assembly in the Elbow. Elbows can be Square or "Change of Size Elbows." Works equally well with either Single Vanes or Hollow Vanes.



Union Made
Patent Pending

Check these Time, Money Saving Advantages

Greatly reduce assembly time · Shear Vanes from scrap · Eliminate layout · Completed Turning Vanes conform to Engineering Specifications · "Duro-Vane-Rail" lies flat in duct · Shipped, bundles of 8 ft. Rails · Broad point chisel comes with bundle

DURO-DYNE CORP. Dept. B

38 SOUTH FRANKLIN STREET
HEMPSTEAD, L. I., N. Y.

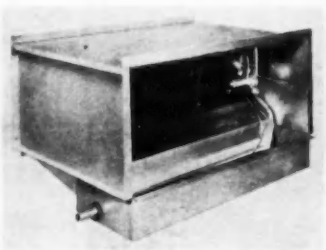
Send for Free Demonstration Kit

and Manual on how to save on construction of Air Turning Vanes. Only requests on Company stationery honored.

CUTAWAY shows how finished Vane Assembly looks installed in Square Elbow.

equipment developments . . .

1600 Webster Ave., Dayton 1. The coil is encased in a 21 gage steel wrapper. Removable side panels permit either horizontal or vertical installation in forced warm air ducts. Dimensions for the horizontal installation (excluding flanges and condensate pan) are: width, 30 in.; height, 12 in., depth, 22¾ in. Vertical dimensions are: width, 30 in.; height, 18¾ in.; and depth, 12 in.



Above: Punching Unit

Left: Evaporator Coil Assembly

Hole Punching Units

TYPE H horizontal hole punching units designed to punch holes in curved and straight flanges, rims and angles and similar shaped and formed work — Wales-Strippit Corp., 345 Payne Ave., North Tonawanda, New York. Punching holes in the side of the work instead of on top of flat surfaces is possible because units are designed so that the punches move back and forth horizontally rather than vertically. Each unit is self-contained, permitting the same group of units to be used and re-used on press brake rails and on templates in stamping presses. All parts are held as a unit by the holder, which assures perfect alignment of punch and die, the company states. The unit will punch holes up to ½ in. in diameter in mild steel up to ⅛ in. thick.

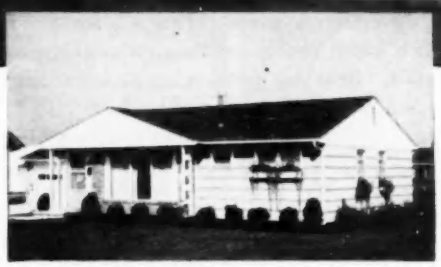
Fan and Limit Control

TYPE FAL-20A combination fan and limit control with a summer switch, for use in warm air heating — Crise Controls Div., Acro Mfg. Co., 2040 E. Main St., Columbus 16, Ohio. A spiral "watch-spring" type bimetal element holds the overall depth of the unit to less than 2 in., permitting mounting within a minimum area between the control panel and the heat exchanger. Scale settings are visible through a dial. The control housing is 5¼ in. wide, 3½ in. high and 1¾ in. deep.

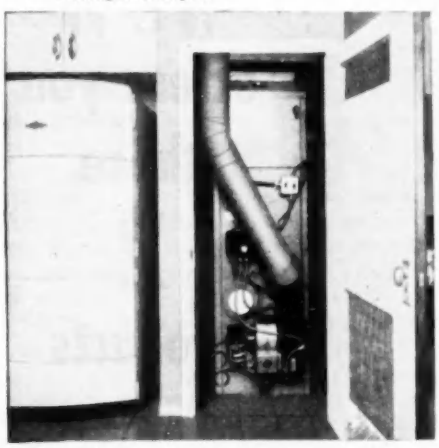
Space Conditioner

"PALMAIRE, JR., 4-Way Weatherman" space conditioner which heats, humidifies, circulates air and can be used as a spot evaporative cooler — Palmer Mfg. Corp., 2200 W. Fillmore, Phoenix. This UL approved unit is portable, and is plugged in for operation (the dial is set for the appropriate season). As a heater, it has a 1350 watt heating element producing 4600 Btu. As a humidifier, it is filled from the side, through a pullout trough, with 2 gal of water. A pump circulates water from the reservoir in the bottom over a specially developed spun glass pad which filters the air drawn through it by the fan.

Kaustine Quality FURNACES HELP SELL HOMES!



Kaustine Units enabled the builder of these homes to provide extra living space without sacrificing heating efficiency . . .



and furthermore, their extremely quiet operation made them ideal for installation in kitchen closets as illustrated above.

COMPACT KAUSTINE UNITS PROVIDE EXTRA LIVING SPACE AT LOWER COST...

• Faced with constantly increasing building costs, more and more builders are turning to Kaustine Engineered Heating to help them sell homes.

With Kaustine they cut construction and installation costs . . . save usable space . . . and offer their prospects the *finest* and most *economical* heating equipment.

Here are *four hundred* quality homes equipped with Kaustine fully automatic oil fired "Counter-Flo" Units delivering 75,000 B. T. U.'s that need only 3½ square feet of floor space to operate efficiently.

WRITE FOR FULL INFORMATION TO DEPT. A-10

Kaustine COMPANY, INC. PERRY, NEW YORK

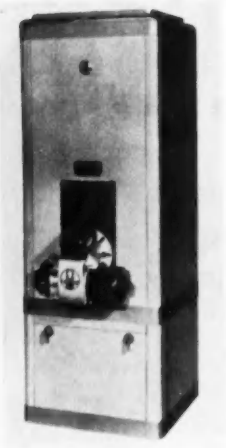
QUALITY COSTS LESS

There is a Kaustine Furnace or Winter Air Conditioner for every type of home.

equipment developments . . .

This humidified air can be warmed by the heating element or the unit can act as an evaporative cooler, leaving the air unheated. The unit can also be used as an electric fan.

Above: Space Conditioner



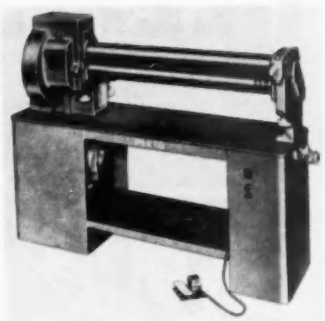
Right: Counterflow Conditioner

Highboy-Counterflow Unit

HIGHBOY OIL FIRED winter air conditioner so constructed that the installer can change the blower unit from the bottom to the top of the heat exchanger in a short time — J. L. Gillen Co., 12202 Wormer, Detroit 28. The furnace has a 105,000 Btu output at the bonnet.

Powered Slip Roll Forming Machine

"PEXTO" POWERED forming machine, slip roll type, in sizes of 3 x 36 in. for 14 to 16 gage, 3 x 48 in. for 16 to 18 gage — The Peck, Stow & Wilcox Co., Center St., Southington, Conn. The powered third roll picks up



stock from pinch rolls. The rear roll is grooved for easy starting, the company states. There is a forward-reverse foot switch which can be set for continuous or momentary contact. Rear roll position indicators are designed to provide accurate duplication of work.

equipment developments . . .

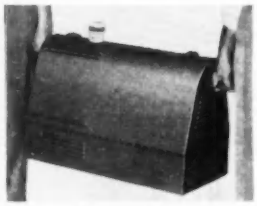
Counterflow Furnace

MODEL ORD oil fired counterflow furnace, with a capacity of 100,000 Btu at the bonnet — Toridheet Div., Cleveland Steel Products Corp., 7306 Madison Ave., Cleveland 2. It can be installed in a closet or utility room, in or adjacent to living space. The wall flame burner is quiet in

operation, the company states. Two 10 x 20 in. filters are accessible through double doors at the top of the cabinet. All servicing is done from the front of the unit through removable panels. The flue pipe can rise vertically from an elbow mounted to the flue outlet. The unit can be installed in a closet 36 x 52 in. in size.

Motor for Oil Burners

FRACTIONAL HORSEPOWER motor for high and low pressure oil burners, smaller and lighter than the company's previous models for this application — General Electric Co., Fractional Horsepower Motor Dept., Schenectady 5. It features reversible rotation in 1/8 and 1/6 hp ratings.



Above: Heater
Left: Motor

Portable Heater

MODEL E-600 heater which weighs 114 lb. and produces 60,000 Btu per hr of fresh air output — Perfection Stove Co., 7609 Platt Ave., Cleveland 4. The heater is self-contained, including a centrifugal pressure-type dual blower which separates the ventilating air from combustion air while using one motor. It can be operated from 110 volts a-c or 24 volts d-c.

new literature . . .

Registers and Grilles

AIR CONDITIONING registers and grilles and gravity registers and floor cold air faces are covered in a pocket size catalog (50 pages) — Rock Island Register Co., 2435 Fifth Ave., Rock Island, Ill. Also listed are sheet metal tools, brakes and power seamers and flangers.

Oil Furnaces

OIL FIRED FURNACES featuring a two capacity system designed to eliminate fuel waste are described in an eight page booklet (ADG-128-10M) — The Williamson Heater Co., 3500 Madison Rd., Cincinnati 9. The booklet lists specifications and dimensions for 21 models rated at from 63,650 to 200,000 Btu output.

Metal Fastening Equipment

FASTENING catalog describes screws, bolts, nuts, pins, rivets, etc. — Stronghold Screw Products, Inc., 1801 W. Winnemac Ave., Chicago 40.

Metal Working Shears

POWER AND FOOT operated shears for metal working are illustrated in bulletin No. 16 — Barth Engineering and Mfg. Co., Milldale, Conn. Included are specifications on foot operated squaring shears for 16 gage metal from 36 to 72 in. in length, gap shears 42 to 72 in. in length for 16 gage metal, and a 96 in. shear for shearing 18 gage mild steel. Two power operated shears for 14 gage metal in lengths of 52 and 72 in. are also described.

Structural Design with Aluminum

HOW TO AVOID beam failure in torsion and in compression is explained in Technical Advisor No. 22 — Reynolds Metals Co., 2500 S. Third St., Louisville. The other articles include information on a new procedure for keeping architectural aluminum bright when exposed to city and industrial atmospheres and a description of a newly developed machine for automatically making circumferential welds in aluminum pipe lines.

Welders

DETAILS of design and construction of "SR" welders are given in a four page folder — Miller Electric Mfg. Co., Appleton, Wis. Illustrated are specialized applications — remote control, specialized control, and parallel operation.

Dust Control in Metal Working

HOW DUST can be controlled in metal working industries is discussed in bulletin 392 — American Wheelabrator & Equipment Corp., 1370 S. Byrkit St., Mishawaka, Ind. Particular attention is given to the use of high efficiency,

new literature . . .

cloth tube type dust collectors in the ventilation of grinding and annealing operations and blast cleaning equipment.

Oil Burners

CIRCULARS describe oil burners ranging in capacities from 0.65 to 20 gph — United States Burner Div., The Carlin Co., River Rd., Wethersfield 9, Conn. The folders are illustrated with photographs of complete units and of various design features. Also included are engineering data and a list of sales helps including consumer literature, decals, bulletins, etc.

Ladder Props

LADDER PROPS which will adjust to any width ladder and are designed to provide rigid bracing for work on roofs or side walls are illustrated in a two page circular — Melaway Corp., Brandon, Wis. The ladder props are made of steel tubing, are designed for attachment to side rails of ladders.

Welding

A SET OF WELD standards printed on tracing paper so that they can be blueprinted or otherwise reproduced is included in the loose-leaf booklet *Weld Standards* — The Lincoln Electric Co., 22801 St. Clair Ave., Cleveland 17. For a specified plate thickness the standards show the electrode type and size, the polarity and current, electrode meltoff rate, arc speed, number of passes or beads, feet of joint welded per hour, and lb of electrodes required per ft of weld. Standards have been prepared for manual welding of butt welds, fillet welds, and lap and corner welds in all positions in both plate and sheet metal. Price of the booklet is $1.00.

Plastic Exhaust Hoods, Ducts and Fittings

BULLETINS 752, 753 and 754 cover exhaust hoods, duct fittings and ventilating ducts made of plastic reinforced with fiber glass — Heil Process Equipment Corp., 12901 Elmwood Ave., Cleveland 11. The exhaust hoods, in a variety of types, are recommended for use where chemical fumes are handled. Round and rectangular ducts are available. Fittings include ells, tees, flanges, etc.

Draft Aid

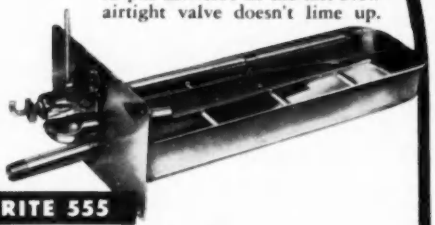
ENVELOPE ENCLOSURE illustrates eight common heating problems that may be overcome by the installation of a mechanical draft aid — Quickdraft Co., Div., The Hall's Safe Co., Inc., 1642 Cleveland Ave., N. W., Canton 3. According to the manufacturer, the unit stops condensation on gas fired units; eliminates pulsating or chattering, sooting and oil film where oil is burned; and ends

Automatic Humidifiers

A COMPLETE LINE WITH A TYPE AND SIZE FOR EVERY WARM AIR FURNACE

THERMO-DRIP

Gives furnace owners the most efficient, most dependable way to put moisture in the air. New airtight valve doesn't lime up.

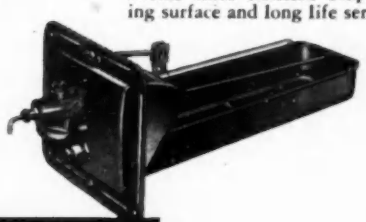


VAPORITE 555

Completely assembled for lowest cost installation. Positive thermostat control feeds water to vapor pan in proportion to heat. Gives proper balance of moisture.

VAPORITE 500

Quick heat transfer stainless steel pan available in sizes tailored to fit most applications. Makes most efficient evaporating surface and long life service.



NEW VAPORITE 577

New pre-assembled model for straight or sloping bonnet. Extra ridged mounting adjusts simply for any bonnet angle. Absolute minimum installation time.

MODEL CF500

FOR COUNTER FLO FURNACES
Makes healthful humidified warm air available in homes with perimeter systems. Requires no pan. Takes no space. Bottom of plenum chamber in concrete floor is evaporating surface. Write today for free literature.

A-103

AUTOMATIC HUMIDIFIER CO.
CEDAR FALLS, IOWA

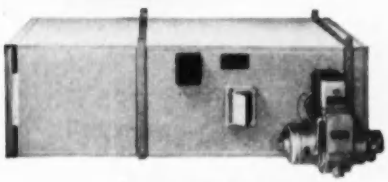
HIGHBOY Model 85

HIGHBOY furnace in 85,000 BTU capacity. Complete with burner, filter, blower motor and controls . . . ready to install.

LOWBOY Models 85, 115, 150, 200

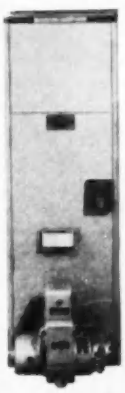
Designed for homes with up to 200,000 BTU output requirement. A complete installation, including burner, filter blower, motor and controls . . . ready to install.

NEW LOW PRICES ON OIL-FIRED WARM AIR UNITS IN GENERAL AUTOMATIC'S BIG PROFIT MONTH!



HORIZONTAL OR SUSPENDED UNIT

85,000 BTU capacity, designed to meet the demands of small homes. Attic or underfloor installation. Complete with dependable General Automatic Model E burner, approved by Underwriters Laboratories.



COUNTERFLOW Model 85

For perimeter or radial warm air heating; for slab or crawl space installation. Ideal all-in-one installation. Complete with burner, filter, motor and controls, all ready to install. 85,000 BTU capacity.

ACT NOW FOR BIGGER PROFITS! WRITE . . . WIRE OR PHONE! For the best in WARM AIR heat . . . combine a General Automatic warm air unit with Floorlevel warm air BASEBOARD HEATING. Send for Spec. 67.

GENERAL Automatic®

GENERAL AUTOMATIC PRODUCTS CORP.
2300 Sinclair Lane • Baltimore 13, Md.

Representatives in Principal Cities.

new literature . . .

smoking or clogging on hand or stoker fired coal heating plants. A new application is the venting of incinerators into the chimney used by the heating plant.

Oil Furnaces

TWO ILLUSTRATED bulletins cover models C, M and MP oil fired furnaces with ratings from 65,000 to 300,000 Btu per hr — Robot Auto-Heat Corp., Middletown, Conn. Included are ratings and dimensions for the various models as well as ordering instructions.

Diffusers, Registers and Grilles

DIFFUSERS, registers and grilles for winter heating and summer cooling are listed in catalog LRC-53 — Lima Register Co., 651 N. Baxter St., Lima, Ohio. Engineering data, performance charts and specifications are included.

Air Conditioning Coils

BULLETIN 103-53 illustrates and describes a line of standard four row air conditioning coils designed for use with domestic and commercial cooling systems — Tenney Engineering, Inc., 26 Avenue B, Newark 5, N. J. Included is information on coil construction, application data, and prices.

Punch Presses

A FOUR PAGE illustrated brochure covers a line of 4 and 5 ton punch presses, swivel-base vises and rotary tables — Kenco Mfg. Co., 5211 Telegraph Rd., Los Angeles 22. The four models of bench type presses shown include the 4 and 5 ton open back models and the 4 and 5 ton "Four-In-One" presses. The latter two models are designed to be converted to a choice of four different types of punch presses: standard die space, long die space, half and horn presses.

Home Heating and Cooling

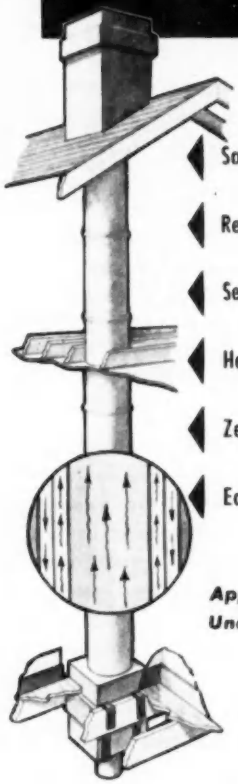
BASIC INFORMATION about heating and cooling the home is contained in a 24 page booklet entitled *Heating and Cooling Your Home* — Coleman Co., Inc., St. Francis & Second St., Wichita 1. In addition to discussing the principles of blended air heating and blended air conditioning, the booklet points up economies which may be realized by the home owner who installs summer cooling.

Belt Center Distance Calculator

BELT CENTER SELECTION for fans and compressors, determination of horizontal distances between shaft centers, and checking equipment clearances are facilitated by a belt center distance calculator — The Korfund Co., Inc., 32nd Pl., Long Island City, N. Y. On the reverse side of the calculator sheet is a fan engineering data sheet giving National Association of Fan Manufacturers and National Electrical Manufacturers data.

NOW IN A 7" FLUE SIZE

THULMAN CHIMNEY



- Saves ¼ to ½ on chimney costs
- Ready-made in lightweight sections
- Self-cooling, non-condensing
- Hangs on joists; needs no footing
- Zero clearance to combustibles
- Easy to install

Approved for all fuels by Underwriters' Laboratories

There's PROFIT in Chimney Sales!

In many a heating deal, you can *sell the chimney, too* — the efficient, low-cost Thulman Chimney. It's today's fastest moving "packaged" chimney! Widely used in the 6" flue size, the new 7" dimension opens up a whole new field of applications . . . a wide segment of the total heating market, including incinerator installations.

Made of porcelain-enameled steel and lightweight aluminum sections, the Thulman Chimney hangs on joists . . . needs no special footing. One man can install it easily in a short time, without special tools. Patented construction makes it self-cooling and non-condensing. Safe and efficient.

Ideal for modern incinerator installation.

WRITE FOR DETAILS!

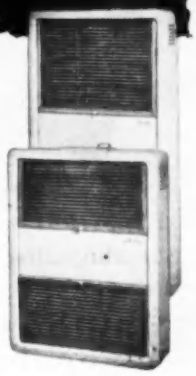
The *Majestic* Co., Inc.

394 Erie St., Huntington, Indiana

Get the lion's share of heating profits with...

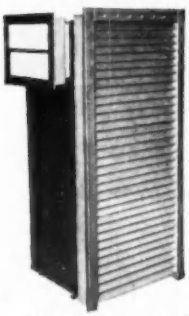
STEWART-WARNER *complete line of...* PACKAGED HEATING!

Saf-Aire* "Safety-Sealed" *Gas Heating



For one room or a dozen, these versatile units do the job better, cheaper, more safely! Gas is burned in patented, sealed chamber. All combustion gases vented *outside*. Only outside air used for combustion. No ductwork, no chimneys, no electricity needed. *Far easier to install!* Ideal for new homes, remodeling jobs and auxiliary heating. Individual thermostat control.

Model 8201. 14,000 BTU/hr. input. 18½" x 25" x 5".
Model 8202. 20,000 BTU/hr. input. 18½" x 37" x 5".
Model 8203. 30,000 BTU/hr. input. 18½" x 48" x 6¼".



***Gas and Oil Fired* Wall Furnaces**

With Super-Comfort warm air and radiant heat flow. Fits snugly in closet or alcove. Smartly styled and finished. Thermostatic control for completely automatic heating. *Conventional design.* Easy to change from one fuel to the other. Automatic fan operation. All controls accessible from front side.

Model WFO-70. Oil fired. 52,600 BTU/hr. output. 20¼"x24"x53¾".

Model WFG-70. 70,000 BTU/hr. input with natural, manufactured and mixed gases. 64,000 BTU with LP gases. 20¼"x24"x50¾".

WRITE NOW: Stewart-Warner Corporation, Dept. B-103, U.S. Machine Division, Lebanon, Indiana, for complete information and details. (Note: select dealerships are still available in some territories.)

STEWART-WARNER CORPORATION

U.S. MACHINE DIVISION • LEBANON, INDIANA

Approved by American Gas Association • Listed by Underwriters' Laboratories

new literature . . .

Universal Machine Tool

BOOKLET describes the "Rindis" universal machine tool for use in tool rooms, engineering shops, mobile work shops, etc. — Newage International, Inc., 235 E. 42nd St., New York 17. The manufacturer states that over 50 different operations can be performed by this machine, including bandsawing, boring, de-burring, polishing, slitting, trimming, die grinding, rotary filing, etc.

Residential Cooling Towers

A FOUR PAGE bulletin (No. WT-582) on residential cooling towers is illustrated with cutaway views and line drawings which detail the mechanical features of the units — Halstead & Mitchell, Zelienople, Pa. A specification table presents cooling tower nominal ratings for both 78 and 75 F wet bulb temperatures.

Gas Fired Unit Heaters

CATALOG 500 (eight pages) contains descriptions, photographs and specifications of propeller fan, gas fired unit heaters — Airtherm Mfg. Co., 706 S. Spring Ave., St. Louis 10. Tables and charts show capacities of the various models.

Sheet Metal Fabricator

A SHEET METAL fabricator for punching, notching and nibbling is described and illustrated in catalog 10-AA — Wales-Strippit Corp., 345 Payne Ave., North Tonawanda, N. Y. It is designed for rapid interchangeability for the different operations. The 1¼ in. holder permits changing of punches and dies for round and shaped holes up to 1¼ in. in diameter. The 3½ in. holder punches round and shaped holes from 1 5/16 to 3½ in. in diameter.

Refrigeration Manual

COMPLETELY REVISED edition of Refrigeration Manual, a 125 page text — The Trane Co., La Crosse, Wis. It is intended to give practical, easy to understand information on the installation, operation and servicing of refrigeration equipment.

Much of the data applies to residential air conditioning applications, and the text is directed to the dealer, contractor and service man.

New chapters have been added on control systems, piping arrangements and servicing procedures. In addition, there is a newly revised refrigeration system service analysis chart.

A chapter is devoted to a discussion of refrigerants and the refrigeration system; other chapters offer information on the selection, installation, and servicing of all the component parts of the remote refrigeration system.

Illustrations include photographs, drawings, charts and graphs. The book may be obtained from the company at $1.50 a copy.

we hear that . . .

CHICAGO DISTRIBUTOR of Carrier year 'round air conditioning equipment, Roy Heier, demonstrates to the new home owner how to switch the equipment from cooling to heating

THE FIRST TWO completely air conditioned model homes of a 96 unit housing development were recently shown to the Chicago area public. The temperature of each house will be maintained by a Carrier Corp., "Weathermaker" packaged heating and cooling system. Perimeter duct distribution is used along with 2½ x 14 in. floor registers. The homes will range in price from $18,900 to $21,500.

A COMPLETE STOCK of furnaces will be maintained at the Merchandise Warehouse Co., 1102 S. Main, Kokomo, Ind., by The Meyer Furnace Co., Peoria. The company is represented in the northern Indiana territory by Phil C. Louttit, 613 Holly Lane, Kokomo.

DISTRICT MANAGERS, sales engineers and representatives from sales offices throughout the United States and Canada attended the recent sales conference held by Penn Controls, Inc.

PENN CONTROLS, INC., recently held a week long conference of the entire sales organization at the main

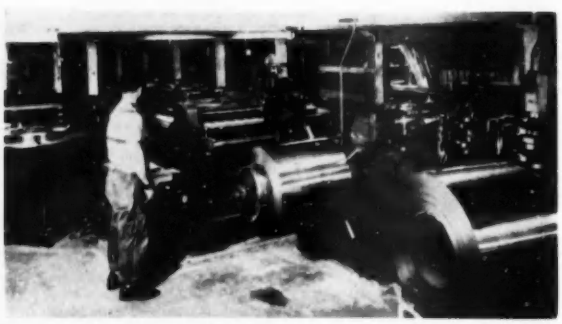
we hear that . . .

office and factory in Goshen, Ind. Stressed at the meeting were increased customer service, new products and product information, and new market developments and potentials.

THE DELAVAN MFG. CO. is offering an oil burner nozzle rack to its jobber customers which enables them to stock a complete line of oil burner nozzles without taking up bin or counter space. The rack has 35 channels with metal dividers separating nozzle types and sizes.

KARR SUPPLY CO., INC., now offers a free delivery service throughout the Wheeling, W. Va., area, within a radius of 50 miles.

THE MERCHANDISING slogan adopted by Karr Supply Co., Inc., (which recently has added to its services the Armstrong Furnace Co. line) is "One stop service for the heating man." In order to live up to its slogan, the company stocks a full selection of furnaces, fittings, registers and allied warm air heating products.



THE PRECISION slitter at Rodney Metals, Inc., features a rewinding arrangement designed to assure good coils and edges; each slit strip has its individual take-up and tension controller

THE NEW BEDFORD, Mass., plant of Rodney Metals, Inc., has recently installed a 25 in. precision slitter especially designed for light gage metals.

BUILT-IN room air conditioners manufactured by Mitchell Mfg. Co. are being featured in the Homestead Gardens

LO-BLAST ECONOMITE

. . . proves amazingly successful in cutting heating costs and improving comfort

A heating engineer writes:

"We got the gas bill and could hardly believe what we saw. Where we used to pay between $30 and $40 per month for oil and another $7 to $10 for bottled gas, our total for last December came to $16.17 (compared to over $40 for December, 1949).

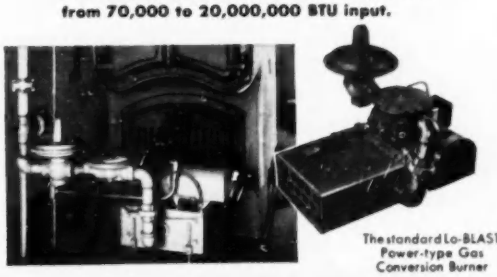
"Our electric bill was also smaller and to top it off, our house was more comfortable, even though December, 1950 was a colder month than December, 1949. The pilot flame of the gas burner seems to supply just the right amount of heat to the furnace walls to maintain a temperature just below the cut-in point of the fan control. A few seconds after the burner starts, the blower starts and thereby stratification is practically eliminated.

"In my 20 years' experience as heating engineer, *I have never been more pleased with the performance of any apparatus than the Economite.*" *(Name and address on request)*

Dealers!

The above letter shows why Lo-BLAST Power Gas Conversion Burners sell! For over 19 years Lo-BLAST Burners have cut heating costs in buildings of every size and character. Write—today—for full information.

Lo-BLAST Burners are available in capacities from 70,000 to 20,000,000 BTU input.



The standard Lo-BLAST Power-type Gas Conversion Burner

MID-CONTINENT
METAL PRODUCTS CO.
1960 N. Clybourn Ave., Chicago 14, Ill.

YOU CAN
INSTALL 'EM FASTER...

CONNOR ENGINEERING CORPORATION

kno·draft®
adjustable air diffusers

Remarkable mechanical simplicity (see pictures below) enables you to install Kno-Draft Adjustable Air Diffusers in half the ordinary time . . . gets your job OK's a lot faster. And, since Kno-Draft is completely adjustable *after* installation, there's no time wasted trying to figure out everything about air movement in advance.

1 INSTALLATION time cut in half, say contractors. Simply attach outer cone to duct, then fasten preassembled diffuser unit to three suspension bolts.

2 AIR DIRECTION ADJUSTMENT made after installation. A few screwdriver turns adjust suspension bolts to the precise discharge angle desired — from horizontal to vertical.

3 BALANCING a Kno-Draft air distribution system is completely simple. Single annular air stream permits easy direct volumetric readings.

4 AIR VOLUME ADJUSTMENT is as simple as a twist of the wrist. Just turn the central operating screw to adjust damper to desired volume.

CONNOR ENGINEERING CORP.
Danbury, Connecticut

Also Manufacturers of
Dorex Air Recovery Equipment

● NEW EDITION! Kno-Draft Data Book now in new 32-page format. Complete up-to-the-minute specifications, engineering and installation data on Kno-Draft *Adjustable* Air Diffusers. Bring your files up to date. Mail coupon today.

CONNOR ENGINEERING CORP.
Dept. S-103, Danbury, Conn.

Please send me the *new edition* of the Kno-Draft Data Book — without obligation, of course.

Name_____
Position_____
Company_____
Street_____
City_____ Zone____ State_____

housing development at Hammond, Ind. When completed, the subdivision will consist of 140 single family residences ranging in price from $11,450 to $15,000.

CONNOR ENGINEERING CORP. has opened a district office in Chicago at 600 W. Jackson Blvd. William W. Quitmeier, who has represented the company in the Chicago area for over a year, has been appointed district manager.

The J. P. GLASBY Mfg. Co. has started construction on a new addition to its plant at Belleville, N. J. The new section will provide 8000 sq ft of additional space.

THE FARR CO. has established a southern division sales office in the Sterick Bldg., Memphis. Donald Harworth is in charge of the new office.

A. S. MARTINSON, president, Hammel Radiator Engineering Co., was recently a delegate to the International Rotary Convention in Paris.

AEROVENT FAN CO., INC., has opened its new general office building at 700 E. Ash St., Piqua, Ohio. A feature of the new building is the five zone air conditioning and heating system which permits automatic temperature control in winter and summer. In addition to the increased floor space provided, facilities have also been expanded for storing parts and accessories.

REPRESENTATIVES attending the regional sales meeting of the United States Radiator Corp., hear about the company's new products, including a new line of summer air conditioners

TWO REGIONAL SALES meetings, one at the Edgewater Beach Hotel in Chicago, and the other at the Hotel Commodore, New York, have just been held by the United States Radiator Corp.

THE ELECTROL Burner Mfg. Co., Inc., has developed a portable oil burner demonstration kit, consisting of

we hear that . .

burner, portable firing box and transparent plastic oil line. The kit is designed for use before technical as well as non-technical audiences, indoors or out, and shows the burner's features in actual operation.

THE NEW PLANT building recently purchased by the St. Clair Metal Products Co. provides more than 30,000 sq ft of floor space

THE ST. CLAIR Metal Products Co., Cleveland, has completed the purchase of a new plant building located at 6700 Central Ave.

ORAN CO. recently held two special showings of its new line of gas fired floor furnaces in Atlanta and Shreveport. Many heating wholesalers, dealers, builders and architects attended the special sessions. The company plans to give similar showings in other areas in the near future.

THE DAYTON ROGERS Mfg. Co., has developed a new method of producing precision die-cut parts. Under the new method, the company says, the size and relative location of pierced holes can be held to a tolerance of ± 0.001 in.

THE CROWN SHEET METAL and Heating Co., Milwaukee, has moved its office, shop and showroom to new quarters at 2831-33 W. Lisbon Ave.

AN AIR FILTER promotion kit being offered by Owens-Corning Fiberglas Corp. includes furnace stickers, utility envelopes, store banners, stuffers, newspaper advertising mats, radio spot announcements and a filter size catalog. The kit is available to dealers through distributors. The company's fall and winter promotion is again being built around Arthur Godfrey's radio program.

EMPLOYEES of American Sheet Metal Works & Supply, Inc., Peter Kiewit & Sons Co. and George Koch & Sons are working together on the construction of the atomic plant at Waverly, Ohio. G. W. Spaniol, Jr., is mechanical superintendent.

we hear that . . .

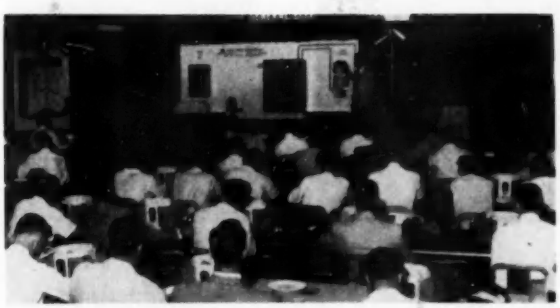
THE EXPANSION program of the Quiet Heet Mfg. Corp., just completed, has nearly quadrupled the company's capacity for production of air conditioners and oil burners. Modernization of 100,000 sq ft of space at the Newark plant has enabled the company to consolidate all its manufacturing, engineering, testing and warehousing facilities under one roof.

THE WESTINGHOUSE Electric Corp. will re-enter the field of room air conditioning in 1954 with a new line of small units. First public showing will take place this fall.

THE ANNUAL picnic and clambake of the Busser Supply Co., was attended by 506 dealers and 39 manufacturers. Contests and games, including baseball, racing, quoits, etc., took place during the afternoon and early evening. Clams were served during the afternoon, and a picnic supper was served at 6:00.

WILDER MFG. CO., INC., has closed its sales office in Carmel, Calif., due to the death of James C. Zancker.

CHRYSLER AIRTEMP shipments of air cooled residential air conditioners passed the 1300 mark in mid-August. The majority of air cooled installations has been made in the eastern Texas, Missouri, southern Ohio and Atlanta regions.



FEATURES of the General Electric room thermostat are explained during a session of the service school while on a tour of the New England states

MORE THAN 700 New England home heating dealers, contractors, and service men attended showings of the General Electric Co.'s service school which covers domestic oil burner controls. The school, conducted by the company's appliance controls department and sponsored by local oil burner dealers and original equipment manufacturers, made 14 stops in Massachusetts, Maine, New Hampshire, and Rhode Island, then moved into the New York area where 21 more shows were given. The company plans a year long coast to coast tour, during which time approximately 150 stops will be made.

appointments . . .

Jack Green

D. J. Ahern

JACK GREEN as manager of the wholesale division of Viking Air Conditioning Corp. Mr. Green will be in charge of heating wholesaler sales of blower packages, humidifiers, window and attic fans, window air conditioners and dehumidifiers. Succeeding Mr. Green in his former capacity as factory sales representative covering the New England states and New York City is D. J. Ahern, previously office manager and purchasing agent for Robot Auto-Heat Co.

ORVILLE BLOEBAUM as San Francisco district manager for The Marley Co. Mr. Bloebaum joined the company in 1949. Since then he has served in the engineering research department, as application engineer in the industrial cooling tower department, and as a sales engineer in the Chicago office.

A. B. Newton

R. W. Qualley

ALWIN B. NEWTON as chief design engineer and Ray W. Qualley as director of research for the Coleman Co., Inc. Mr. Newton, formerly vice president in charge of engineering of Acme Industries, Inc., has been associated with manufacturers of air conditioning equipment and controls since 1930. He is on the board of directors of the Air Conditioning and Refrigeration Institute and is active in ASHVE, ASRE and ASME. Mr. Qualley was previously with Meyer Furnace Co., where for the past six years he has been in charge of all phases of engineering. Julian F. Warren, formerly sales manager, Delco Appliance Div., General Motors Corp., has been named manager of the company's newly formed merchandising department. Associated with Mr. Warren in the new department is Robert T. Hansen, who has been named product manager for central heating and air con-

oil
gas
or coal...

international® Economy

has
all
three!

Carry the dependable, profitable line for all three fuels . . . ***International Economy.*** Hi-Boys, Counterflos, Consoles, Gravity, Forced Air, Blower Units, Unit Heaters, Conversion Burners, Steel, Cast-iron—anything and everything for *your* customer's needs . . . engineered for the fuel they want to use.

It pays to concentrate all your sales fire with International Economy, the *complete* line with over 110 years of heating experience and business integrity at your service.

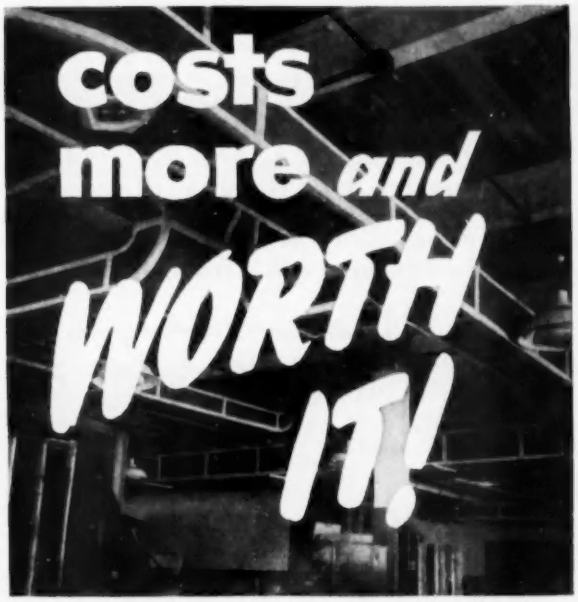
GAS OR OIL LO-BOYS —

Eight oil lo-boys (from 84,000 to 224,000 Btu output) and seven gas lo-boys (from 12,000 to 210,000 Btu input) are available in completely assembled or not assembled units. All carry International's famous TEN-YEAR WARRANTY, your assurance of customer satisfaction!

International

heater co., Dept. A-10, utica 2, n. y.

Western Warehouse: Chicago, Ill.



Grant Wilson DUX-SULATION

(ASBESTOS-PROTECTED)

Sure the initial cost of DUX-SULATION is high — but figure the "Extras" and Labor involved in using other duct insulations and you will see "Why" DUX-SULATION actually costs you less. DUX-SULATION gives high Thermal insulation on Heating or Cooling ducts and reduces noise-travel at the same time. DUX-SULATION saves your client money and you trouble. Here are just a few reasons "Why" you will want DUX-SULATION on all your jobs.

1. DUX-SULATION comes *COMPLETE* with Adhesive, Asbestos Tape and instructions for fast, attractive and secure installation. There are no Extras to buy, or lugs, clips or screws to fasten to the duct work. A DUX-SULATION insulated job is not full of holes — there are no gimmicks and gadgets to come loose, rattle or cause Condensation which lowers the efficiency of the system.

2. Heating, Cooling and Ventilating duct work can even be insulated in the shop and transported to the job without harm. DUX-SULATION'S strong, flexible construction will not sift, shift, crumble, powder, mat down, deteriorate or pull apart on the duct work.

3. DUX-SULATION is safe and easy to handle. It contains no irritating or skin infecting substances. You can be sure of a complete, *PERMANENT*, high Thermal and Acoustical efficiency when you insulate with DUX-SULATION.

There are many more valuable features about asbestos-protected DUX-SULATION described in our Free Sample Kit (No. 5310-A). Write: GRANT WILSON INCORPORATED, 141 WEST JACKSON BLVD., CHICAGO 4, ILLINOIS today. Learn more about DUX-SULATION and "Why" it's worth more than its slightly higher initial cost. See our Catalog No. 10a W1 in Sweets File.

Grant Wilson inc.

ASBESTOS and INSULATING MATERIALS

ditioning. L. L. White, formerly manager of the Philadelphia branch, has been appointed eastern zone manager. Lawrence T. Ash, previously a field director with the gas utility division, replaces Mr. White as manager of the Philadelphia branch. Hascal Simmons is zone manager of the southern office, in Dallas.

LARRY COOPER as president of the Windmaster Corp. Mr. Cooper has been connected with the heating industry for nearly 30 years and has been associated in various capacities with Lennox Furnace Co. and Kalamazoo Stove and Furnace Co.

L. Cooper

E. R. Downe

EDWARD R. DOWNE as vice president in charge of research and development for the C. A. Olsen Mfg. Co. Mr. Downe has been with the company since 1943, as chief engineer and as head of the postwar development of the company's "Luxaire" line.

JACK S. BELDON as manager of marketing for the Air Conditioning Div., General Electric Co. He will be located at the division's headquarters in Bloomfield. Mr. Beldon joined the company last March, has been working on special marketing assignments on consumer goods.

J. S. Beldon

Fred Kaiser

FRED KAISER as manager of the eastern region of Minneapolis-Honeywell Regulator Co., with headquarters in New York. Since 1949, Mr. Kaiser has been field sales manager, working out of the executive offices in Minneapolis. He has been with the company since 1926, has served as branch manager in the Syracuse, Buffalo and Detroit offices and as midwest regional manager, with headquarters in Chicago.

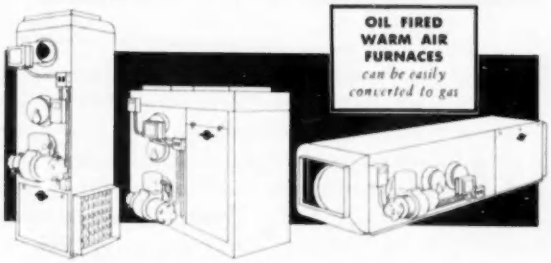
YOU ALSO GET THE

BIG SIZES

in the BESSER line!

A COMPLETE RANGE OF SIZES . . .
from 75,000 BTU to 500,000 BTU

A COMPLETE LINE OF MODELS . . .
Horizontal • Vertical • Basement
Downflo • HiBoy • LoBoy • Suspended



Plus **SPECIAL ORDER SERVICE**
on any size unit **UP TO 1,000,000 BTU**

For jobs that require units larger than 500,000 B.T.U., Besser offers fast, reliable Special Order Service. We have the facilities to build any type unit required, up to 1,000,000 B.T.U. output. Every "special order" is built to the same high standards of the regular Besser line. Whatever your need, we can build it!

And now! **A NEW PROFIT-MAKER JOINS THE BESSER LINE**

Revolutionary

HORIZONTAL Summer AIR CONDITIONERS

for Residential or Commercial installations

Combining space-saving "horizontal" design with an entirely new cooling principle, Besser Summer Air Conditioners bring central air conditioning within the reach of almost everyone. Designed for installation and operation in conjunction with central heating systems, units are fully adaptable to either warm air or hot water heating. Greatly increased efficiency lowers initial and operating costs through use of smaller units.

Available in 2, 3 and 5-Ton units.

"Only the BEST goes into a BESSER!"

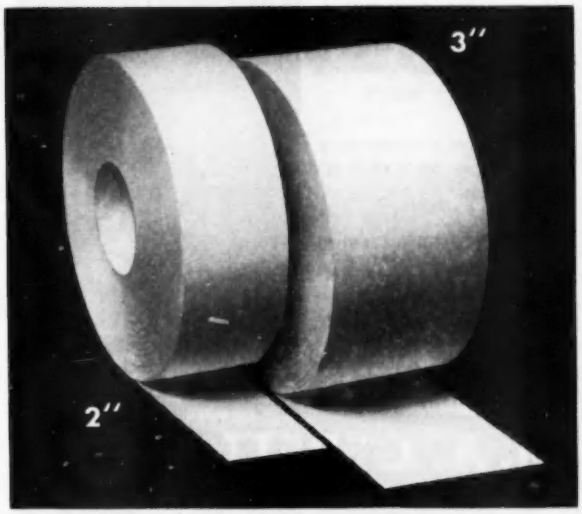
BESSER WARM AIR FURNACES
Summer AIR CONDITIONERS

The Complete Line for Year-Round Profits

BESSER METAL PRODUCTS CORP., P. O. BOX 4064, CHARLOTTE, N. C.

HOW'S YOUR STOCK?

Prompt deliveries now of these essential materials from a handy wholesaler



Sal-Mo ASBESTOS PIPE JOINT TAPE

Assures a clean, neat-looking job—no wrinkling or rough edges. 12 rolls of 3" tape or 18 rolls of 2" tape in a handy carton.

Sal-Mo ASBESTOS PAPER

Sal-Mo ASBESTOS MILLBOARD

Sal-Mo ASBESTOS CEMENT

Sal-Mo ASBESTOS CORRUGATED AIRCELL PAPER

Sal-Mo ASBESTOS AIRCELL SHEETS & BLOCKS

Sal-Mo ASBESTOS FURNACE CEMENT

Order from your wholesaler today!
Be sure to specify SAL-MO!

SALL MOUNTAIN COMPANY
HAMILTON, OHIO

appointments . . .

MARK E. MOONEY as vice president in charge of sales for Typhoon Air Conditioning Co. Mr. Mooney will assume charge of all sales and distribution. He has been associated with several leading firms, including Carrier Corp.

J. A. Cerny

P. J. Schaack

JOSEPH A. CERNY as manager of the sales engineering and information section of Bryant Heater Div., Affiliated Gas Equipment, Inc. Mr. Cerny has been chief development engineer, manager of the sales engineering department and, until his recent promotion, Cleveland branch sales manager. Succeeding him as Cleveland sales manager is Paul J. Schaack, who joined the company in 1935 as a sales engineer. Previously Mr. Schaack was sales manager for the Pittsburgh branch.

H. C. Erhard

W. B. Gathings

H. E. Thomas

H. C. ERHARD as sales manager of the Jersey City sales district of Perfection Stove Co., succeeding W. B. Gathings, who is being transferred to the Cleveland office. Mr. Erhard was formerly manager of the contract sales department, in which capacity he is being succeeded by H. E. Thomas.

P. PORTER as sales manager of the Chicago office of Plasteel Products Corp. Mr. Porter will handle engineering, sales and erection service for new construction, replacement and maintenance needs.

CARL J. REICK as district manager of the newly opened Indianapolis sales office of C. G. Hussey & Co. His assistant will be William T. Tucker. The new office is located at 1535 Central Ave.

SHERMAN T. RAMEY as advertising manager of the Timken-Detroit Axle Co. Mr. Ramey was formerly advertising and sales promotion manager of the Highway

.... the BEST BUY for

INCREASED ATTENTION and LASTING SALES POWER

THE JANUARY 1954 ISSUE

and 20th Annual Directory Number of

AMERICAN ARTISAN

DIRECTORY SECTION ....

We'll tell who makes the products used in this field and their trade names. All advertisers as they appear in this Directory Section will be prominently identified indicating that more detailed information is elsewhere in the issue. It's the industry's best and most complete BUYING GUIDE —printed on colored stock in a special section.

STANDARD EDITORIAL CONTENT .....

January AA will be a "regular issue" in every respect. It will carry a full quota of timely articles—the same as in every issue of this field-leading book. For extra attention value, it will have heavy covers, and be specially mailed.

Here's a regular issue, and a directory issue, combined in one great January number .... and *no advance* over regular issue rates!

Here your advertising will get *increased attention*, and have *lasting sales power* (as product reference copy) throughout all of 1954.

Here is the "best buy" of the year in our field .... the place where a convincing sales story of your complete facilities will do you untold good.

Here is where *extra* space for *extra* emphasis belongs!

Most advertisers use increased space with us in January —spreads, inserts, color. They catalog their entire lines. You, too, can profit most by doing a complete job. Make space reservation now .... we'll be glad to help with copy preparation if needed.

AMERICAN ARTISAN

6 North Michigan Avenue

Chicago 2, Illinois

appointments . . .

Trailer Co., sales promotion manager of the Home Appliance Div., the Murray Corp. of America, and advertising manager of the American Hospital Supply Corp. In his new post, he will be in charge of the advertising activities of both the Timken-Detroit Axle Div. and the Timken Silent Automatic Div.

E. W. GUTGSELL as sales manager of the midwest division of the Cory Corp. In his new capacity, Mr. Gutgsell will be in charge of all sales in the Chicago, Milwaukee, Minneapolis, Iowa and Detroit areas. His headquarters will be Chicago.

E. W. Gutgsell

A. S. Carpenter

ALLEN S. CARPENTER as manager of the Omaha branch office of General Controls Co. He has been with the company since 1950 in sales and customer service. His new headquarters are at 610 Keeline Bldg.

C. A. MONTAGUE as sales manager for the Kalamazoo Furnace & Appliance Mfg. Co. Mr. Montague was formerly regional sales manager in New York State for Kalamazoo Stove & Furnace Co.

A. JAMES HACKL as manager of the Dallas sales office of The Trane Co. Mr. Hackl had been associated with the Jackson, Miss., sales office for four years prior to joining the Navy in 1951.

FORREST L. LINE as director of sales for the newly formed water heater division of Utility Appliance Corp.

F. L. Line

H. G. Gabel

HENRY G. GABEL as Middle Atlantic district sales manager for Century Engineering Corp. Mr. Gabel will headquarter in Norristown, Pa. He will supervise sales in eastern Pennsylvania, southern New Jersey, Delaware,

appointments . . .

Maryland, northern Virginia, northeast West Virginia and Washington, D. C. He was formerly district sales manager for Electric Furnace-Man, Inc.

Lee Davignon as manager of the Milwaukee branch office recently opened by Conco Engineering Works. Mr. Davignon for the past several years has worked out of the company's Chicago office. The new branch will include facilities for warehousing equipment and parts as well as a sales and engineering service.

Lee Davignon

H. H. Thompson

Hayden H. Thompson as New England district sales manager for Robot Auto-Heat Corp. Prior to his recent appointment Mr. Thompson was eastern sales manager for Phoenix Mfg. Co. Bergen Fuel Co., Hartford, has

appointments . . .

been appointed wholesale distributor of oil burners and furnaces in the state of Connecticut.

E. J. Ovshak as secretary of the L. J. Mueller Furnace Co. Mr. Ovshak joined the company's accounting department 17 years ago, and for the last 12 years has served as assistant secretary.

Don Davidson as sales manager for Calcinator Corp., manufacturer and distributor of incinerator equipment. Mr. Davidson was formerly sales promotion manager of the dryer and ironer divisions of the Whirlpool Corp.

F. S. Crook Co., 455 Paul Brown Bldg., St. Louis, as representative for the Roof Ventilator Div., The Swartwout Co.

Filter Engineers, Inc., Chicago, and Air Filter Sales and Service of Miami, Inc., as representatives handling sales and service of Far-Air products for the Farr Co.

Hyslop & Fisher as sales representatives in the Cleveland area for Toledo Porcelain Enamel Products Co., to handle the sales of "V-Corr" enameled steel roofing and siding material. Other representatives recently appointed to handle this product are Kennedy Building Products, Livonia, Mich.; L. C. Murphy & Co., St. Louis; Van Scoy

Mr. Dealer:

Are You Getting the MOST from Your Franchise?

Mr. Dealer, here's a real challenge. Investigate the Anchor franchise. We bet you'll agree that you'll say, "It's Anchor for me".

The Anchor franchise actually helps pay your income tax. Amazing? Yes—but absolutely true! Combine Anchor's great line of products with the Anchor franchise and you're due for *more* sales with *higher profits* than ever before.

A COMPLETE FURNACE LINE

HI BOY MODELS
LO BOY MODELS
FOR VAPORIZING OIL
FOR HI-PRESSURE OIL
FORCED AIR TYPES
GRAVITY TYPES
From 59,200 to 148,000 BTU

Write Today for Complete Details

ANCHOR DIVISION
STRATTON & TERSTEGGE CO., INC.
P. O. BOX 311 NEW ALBANY, IND.

---

with MECHANICAL action you install it... FORGET it!

The DAFFIN model 550

PLENUM HUMIDIFIER

- Positive Output — 3.9 pints per hour, sufficient for the average home.
- Injects water vapor directly into warm air stream from furnace.
- Rust-proof alloyed copper construction for years of dependable service.
- Furnace cycle automatically controls humidifier.
- Saves 8 to 10% on annual fuel costs.

Daffin Humidifier mounted on packaged heating unit.

Daffin Manufacturing Company
1203 N. Prince St., Lancaster, Pa.

"CORRECT PRACTICE in OIL HEATING"

NOW AVAILABLE TO YOU!

A complete reprint of the valuable series

by J. J. Mirabile

This practical series covers every angle of oil burner work, including arrangement of shop . . . stocking of parts . . . record-keeping . . . installation procedures . . . the handling of crews . . . how to make heating surveys . . . how to size combustion chamber . . . how to install thermostat . . . how to start the burner . . . how to use testing instruments . . . and how to operate a service department. It contains, as well, a complete list of causes and cures of oil burner troubles that will serve as a reliable guide in making service calls.

Every shop handling oil burner jobs should own this book. Full size, 8½ by 11 inches — 57 pages of practical helps. Send $1.00 for a copy today to the address below.

KEENEY PUBLISHING COMPANY

6 No. Michigan Avenue Chicago 2, Ill.

WEBCO *the portable*

SHEET METAL BENDING BRAKE

The WEBCO brake offers the Slip End, Sliding Folding Fingers, and many other important features. The WEBCO will make bends up to 52°. Write for detailed information to:

HALLMOR INC.
McMURRAY ROAD
BRIDGEVILLE, PA.

appointments . . .

Sales Co., Kansas City, Mo.; Emil Ostman, New York City; James W. Keavy, Syracuse; Henry E. Schweinsberg, Fairmont, W. Va.; L. C. Wild and Co., Houston; Riggs Industrial Supply Co., Blue Island, Ill.; L. T. Merriam, Greenfield, Mass.; Alfred Cargill, Miami; Allied Materials Co., Pittsburgh; and Beaman Engineering Co., Greensboro, N. C., who will also cover Atlanta and Richmond.

DON C. ZINTER as sales manager of the Adams Mfg. Co. Mr. Zinter, formerly with White-Rodgers Electric Co., will direct all sales activities. Jack Farnsworth has been named regional sales engineer, with headquarters in Chicago. James A. Morse has been appointed chief engineer.

JOHN D. MEYER as sales manager of the appliance division of Trion, Inc. Mr. Meyer will be in charge of sales of packaged electronic air cleaners for residential application.

CHICAGO STEEL SERVICE, Kildare Ave. and 45th St., Chicago, as distributor for the Rigidized Metals Corp.

WILLIAM FERRY as representative in Wisconsin and northwestern Michigan for R. Wendell Franks and As-

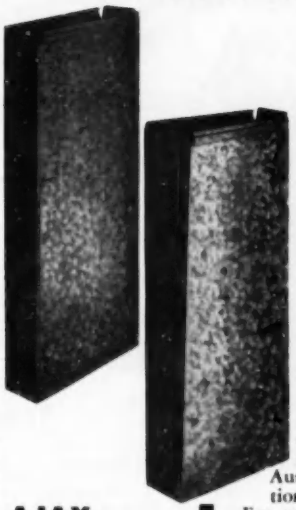
1st CHOICE of Both FURNACE MANUFACTURERS AND CONTRACTORS

Standard in the field for nearly 40 years. THARCO stays put! — No shrinking, cracking or checking. Now available in either black or light gray in 1-pound cans to 350-pound drums. Order from your jobber.

The ARMSTRONG COMPANY

241 S. Post Street — Detroit 17, Michigan

ALL YOUR NEEDS In DUCTS and FITTINGS



AJAX

- Highest Quality
- Precision Made
- Quick Assembly
- Forced Air or Gravity
- All Systems

Fittings, Pipe and Duct are die cut and formed, fit up tight and fast with AJAX Automatic Snap Lock connections.

For extra profits, use AJAX Pipe and Fittings to save you installation time and labor.

WRITE TODAY

New complete line catalog complete with helpful data.

AJAX FURNACE FITTING CO.

216-20 E. Front St.
Cincinnati 2, Ohio

DIVISION Of THE CINCINNATI SHEET METAL & ROOFING COMPANY

FLORITE Direct-Reading AIR VELOCITY METER

- *A practical, accurate air velocity meter for heating, air conditioning, and ventilating work. Indispensable for measuring grille velocities and air deliveries from registers and grilles; for balancing forced air heating systems, and for checking air distribution of all kinds of ventilating systems.*
- *Accurate velocity readings, automatically averaged over a 3" dia. free area, instantly indicated in feet per minute.*
- *Extension handle facilitates positioning of instrument away from the observer for readings in hard-to-reach locations, or where the observer's body would interfere with the normal air movement.*
- *Unique scale lock makes possible to retain scale reading when desired until the lock is released—an indispensable feature where extension rod is used to position instrument away from the observer.*
- *Leather case is furnished as standard equipment for added protection when the instrument is not in use and for convenience when carrying it in the pocket.*

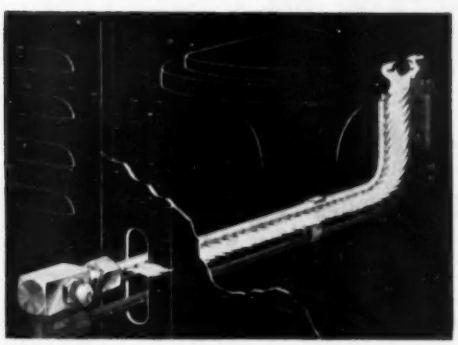
Ask your Jobber for the FloRite or write for Leaflet 760.

BACHARACH INDUSTRIAL INSTRUMENT CO.

7301 PENN AVENUE • • PITTSBURGH 8, PA.

The MODERN LIGHTER TUBE

With the Slanting Blue Flame



OUTSIDE LIGHTING IS HERE!

for FURNACES • WATER HEATERS • BOILERS • INCINERATORS

- ★ **SAFE** as the unit it serves.
- ★ **DEPENDABLE** as the gas supply.
- ★ **SIMPLE** as the scratch of a match.
- ★ **CONVENIENT** as the touch of a button.

MODERN MATERIALS COMPANY

Northville, Michigan

appointments . . .

sociates, who handle the products of Skuttle Mfg. Co., the Windmaster Corp., and Buckeye Furnace Pipe Co.

JEROME TIEGER as heating and cooling engineer for Hajoca Corp. He will make his headquarters in the heating department, located at the corporation's Erie Ave. branch in Philadelphia.

EISBRENNER HEATING SALES, Peru, Ind., as representatives in the state of Indiana, excluding the seven southernmost counties, for Maid-O'-Mist, Inc.

EDWARD P. SMITH as sales engineer in the Manhattan-Long Island territories of New York for the Wales-Strippit Corp.

Fred H. Heads

FRED H. HEADS, for 28 years sales representative for the Hart & Cooley Mfg. Co., died on Friday, September 4, following an illness of several weeks. Mr. Heads joined the company in 1921, doing clerical work in the Chicago office prior to joining the sales staff in 1925. Surviving are his wife, one son, two grandchildren, two brothers and one sister.

CLASSIFIED ADVERTISING

Rates for classified advertising are 10 cents for each word, including heading and address. One inch $5.00. Count seven words for keyed address. Minimum $2.00 for each insertion. Cash must accompany order.

wanted . . .

Draftsman. Warm air heating. Installation supervision. Work interesting and diversified. Salary based on experience. Anderson Heating Co., 1341 West 87th Street, Chicago, Illinois.

situation wanted . . .

Job wanted as sheet metal shop foreman. Qualifications — 34 years experience, can handle men, any kind layout. Honest, sober and dependable. Age 50, good health. Go anywhere. J. B. Dawson, Box 42, Lake Hamilton, Arkansas.

. . . . are you looking around
for items or personnel
to make your organization more
efficient? A simple classified
advertisement
in American Artisan
will turn the trick
for you quickly and
at low cost.

agents wanted . . .

WANTED

Hard-hitting, sales-producing Manufacturers' Representatives for leading, quality, brand-name line of nationally advertised standardized pipe, duct, and fittings for year 'round residential systems. New and exclusive representation in Ohio and West Virginia desired by one of the outstanding companies in the field. If you can deliver a whale of a selling job, send complete details including experience, other lines handled, territories covered, etc., at once. Address Key 947, American Artisan, 6 No. Michigan Ave., Chicago 2, Ill.

for sale . . .

FOR SALE

TOOLS & DIES FOR MFG. REGISTERS AND GRILLES
Complete line; active customer accounts. Change in business reason for selling. Excellent Opportunity. Address Key 948, AMERICAN ARTISAN, 6 No. Michigan Ave., Chicago 2, Ill.

FOR SALE

SMOKE PIPE AND ELBOW EQUIPMENT
Four Adjustable Elbow machines, one Stove Pipe Elbow machine 3" to 8" Dia., one Maplewood "Model H" Pipe Roller, one Maplewood "Model G" Pipe Lock machine, all necessary Jigs and Fixtures. Owner retiring. Write, L. Miller, 553 River Rd., North Tonawanda, New York.

Contribute to the
KOREAN ORPHAN FUND

Rates for display space in the Service Section are $10.00 per inch per insertion. One-inch minimum space accepted.

SERVICE SECTION

INDEX TO ADVERTISERS

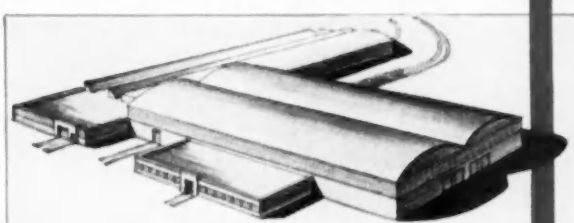
Firms represented in this issue are identified by the folio of the page on which their advertising appears. Advertising which appears in other issues is marked with an asterisk.

Galvanized Steel Sheets from Wolff Metal Service

have the working qualities YOU want

● Galvanized steel sheets aren't all alike, even though the sizes and gauges in supplier's stock books show them to be identical. There are many points of contrast . . . as accuracy to gauge, brightness of spangles, uniformity of the spelter coat, differences in flaking tendencies, and variances in the working qualities of the sheet.

Wolff galvanized steel sheets bring you the best of these desirable metal characteristics important to shop men who take pride in what they do. The sheets that Wolff delivers represent *quality that you can sell*, not "something" to sell to you. Because hundreds of buyers of galvanized have found this to be true, Benjamin Wolff and Company has grown into the most modern warehouse structure in the Midwest. It will pay you, too, to call Wolff first, the next time you need galvanized steel sheets . . . or anything else in



Chicago Phone
EStebrook 9-2500
Melrose Park Phone
Fillmore 4-7200

WOLFF METAL SERVICE

Carbon Steels, Stainless Steels, Aluminum, Copper, Expanded Metal, Tin Mill Products, Metal Decorating

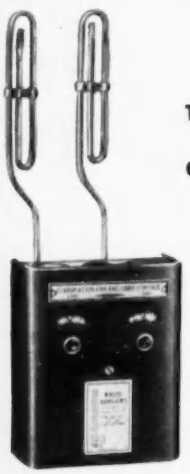
BENJAMIN WOLFF AND COMPANY

General Office and Warehouse — 1945 North Cornell Avenue, Melrose Park, Illinois
Wisconsin Office — 176 W. Wisconsin Ave., Milwaukee 3, Wisconsin

Sid says:

The Original Hydraulic-Action Fan and Limit Controls by White-Rodgers are still the industry's first choice!

White-Rodgers Original Hydraulic-Action Limit Controls protect the heating plant against dangerously high temperatures; Fan Controls provide positive control on forced warm-air systems; Combination types provide two independently operating controls in a single compact case.

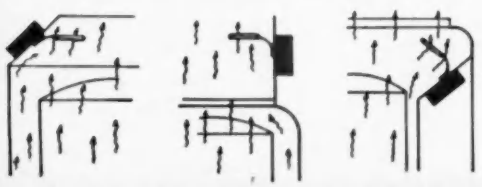


The Original—
Hydraulic-Action
Combination Fan & Limit

Two independently operated controls in a single case . . . ease in mounting and installation.

Hydraulic-Action Plus—

Because these controls operate on the famous Hydraulic-Action principle, they have many advantages. They mount flush with the furnace casing and require no leveling. The flexible element may be bent in any position, assuring control from the most desirable location.



Easy to Set—

Cut-in and cut-out temperatures are quickly set. Dials are calibrated in degrees Fahrenheit, permitting exact temperature settings. All control settings can easily be made with an ordinary screwdriver.

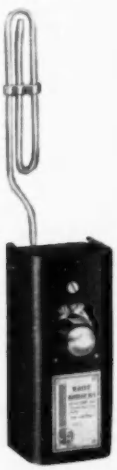
Sturdy Switch—

Extra-sturdy switch mechanism provides reliable snap-action and positive contact closure, resulting in long control life. The switch mechanism is entirely enclosed, preventing entrance of dirt and foreign matter.

No Temperature Drift—

No temperature drift ever is found in White-Rodgers original Hydraulic-Action controls . . . factory-set calibration remains permanent throughout the life of the control.

Single-unit Fan or Limit Control showing key (screwdriver) type adjustment of temperature settings.



Single-unit Fan or Limit Control showing knob-type adjustment.

Let SID help you!

Fill in and mail the coupon below TODAY. It will bring you a continuous series of service bulletins helpful to you in making your installations.

WHITE-RODGERS
Controls FOR REFRIGERATION HEATING AND AIR CONDITIONING

ST. LOUIS 6, MO.

BRANCHES—
NEW YORK, N. Y.—[illegible]
CHICAGO, ILL.—[illegible]
CLEVELAND, OHIO—[illegible]
DETROIT, MICH.—[illegible]
BUFFALO, N. Y.—[illegible]
PHILADELPHIA, PA.—[illegible]
Branch Sales Offices in All Principal Cities

PLEASE PRINT

WHITE-RODGERS ELECTRIC CO.
Dept. 218
1203 Cass Ave., St. Louis 6, Mo.
Gentlemen: Please send me your information bulletins.

Name_____

Home Address_____

City_____ Zone____ State_____

Kind of Work_____ Birthday_____
(DAY) (MONTH)